FEB 3 1926

Marine Review

THE BUSINESS OF TRANSPORTATION BY WATER

NEW YORK CLEVELAND LONDON

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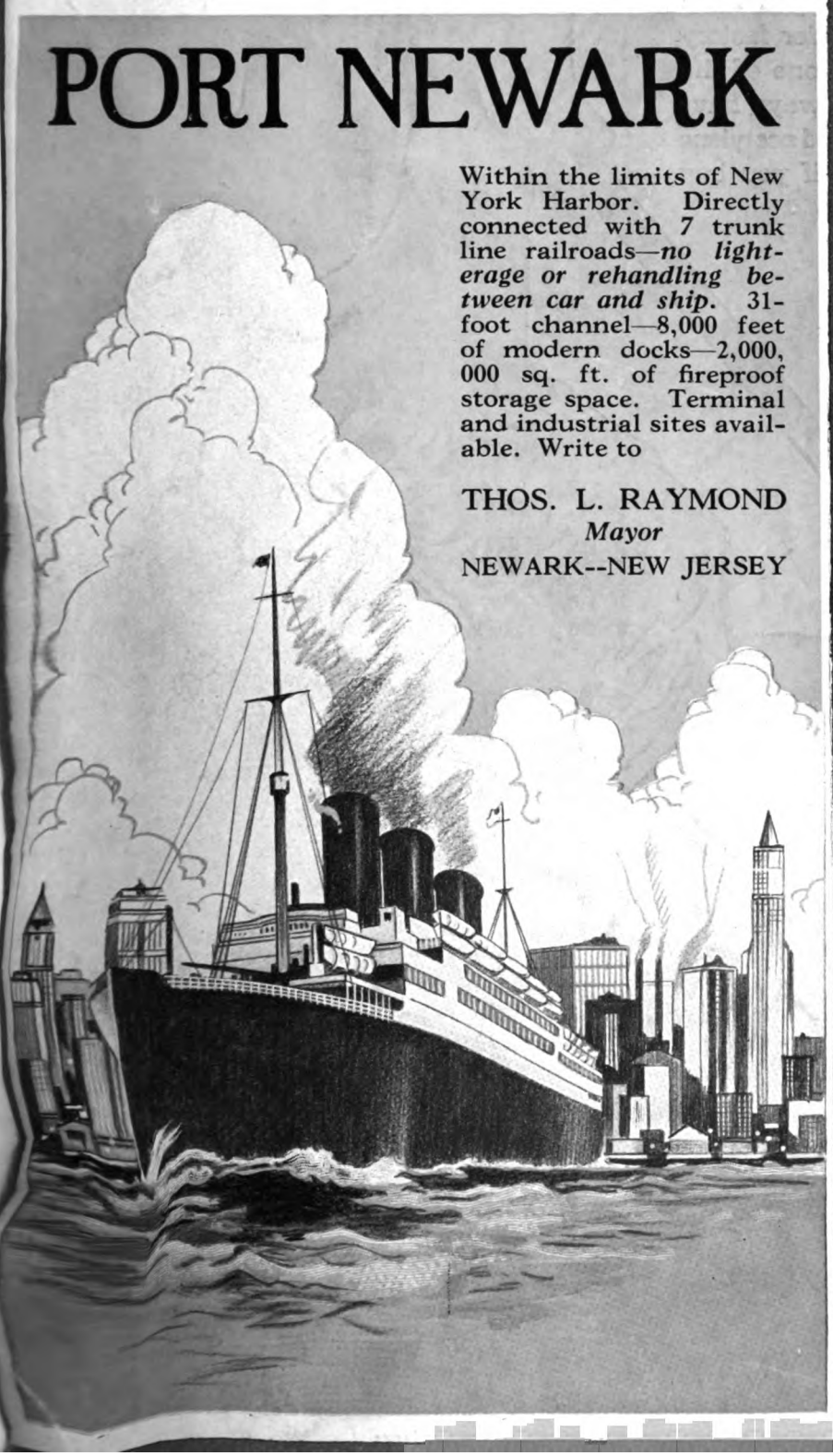

Your Guide To this Issue

Steam Power

THAT steam is still supreme for motive power in certain types of ships is the very strong impression gained on inspecting the S. S. COAMO.

See Page 11

Navy Investigates

A NAVAL inquiry decided that the unfortunate S-51 was not at fault in the collision with the CITY OF ROME. An impartial investigation should be made.

See Page 12

Fast Freighters

WHERE the supremacy of the diesel engine is unquestioned—in large fast freighters engaged in long voyage trades. We need to wake up to their economic superiority over our slow and wasteful steamships.

See Page 13

New Welland Canal

CANADA is building a new Welland Canal between Lakes Erie and Ontario with locks 859 feet long. A fully illustrated story tells of the progress made.

See Page 15

A Panorama

THE building of the latest 600-foot Great Lakes freighter from the laying of the keel to the launching is illustrated by seven views taken at regular intervals.

See Page 17

Port of Victoria

VICTORIA, B. C., Canada's gateway to the Pacific, is sure to play an important part in the growth and development of the Northwest. A fully illustrated article describes the facilities of this port.

See Page 26

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Marine Review

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CONTENTS

Vol. 56 **February 1926** *No. 2*

Where Steam Is Still Supreme..... 11
Naval Court Holds S-51 Blameless..... 12
Build Fast Diesel Freighters..... 13
New Welland Canal Progress..... 15
Launch S. S. Col. James Pickands..... 17
Honor Captain and Crew..... 18
Deepen and Widen Barge Canal..... 19
By W. S. Fallon
Improved Marine Diesel Engine..... 20
By R. H. Bacon
Keep the Great Lakes Intact..... 21
From the Old Log Book..... 22
Photographs from Far and Near..... 23
Maritime Law, Late Decisions..... 24
By Harry Bowne Skillman
Personal, D. N. Hoover, Nicholson, Teller..... 25
Victoria—Canada's Pacific Gateway..... 26
By Frank Gioima
What the British Are Doing..... 28
What's Doing Around the Lakes..... 28
Congress and the Merchant Marine..... 29
By Fred B. Pletcher
Ocean Freight Rates—Bunker Prices..... 30
Follow Rules for Boiler Welding..... 31
Port Statistics Condensed..... 32
Marine Disasters, Late Flashes..... 34
Recent Sales of Ships..... 44
Seamen's Discharge Books..... 46
Bulk Cargo Movement, Great Lakes..... 48
New Trade Publications..... 56
Business News for Marine Trade..... 56

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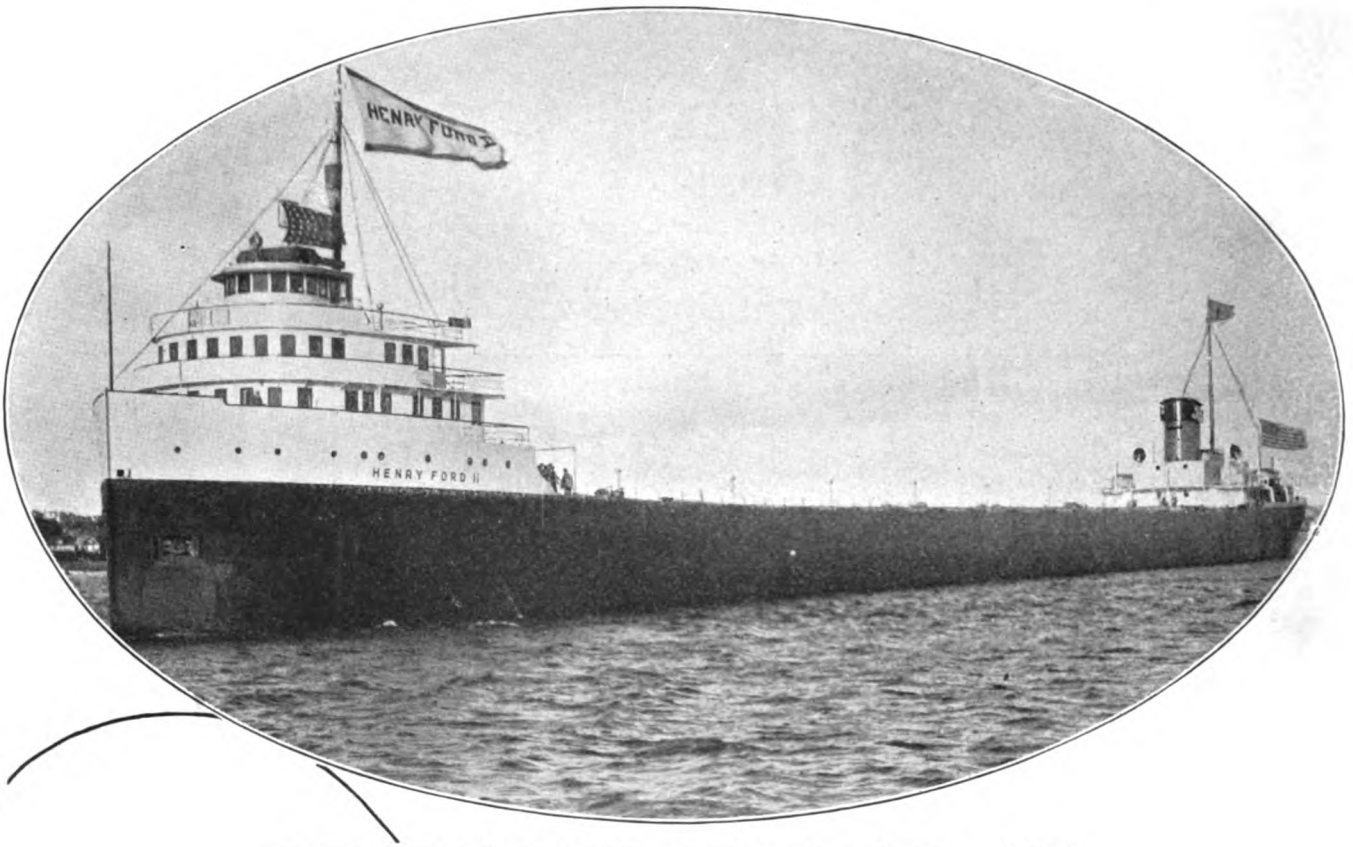

HENRY FORD II.

Built by The American Ship Building Company

The American Com

General Office:
Foot of W. 54th St., Cleveland, Ohio
Construction Plants at:
Lorain **Cleveland**

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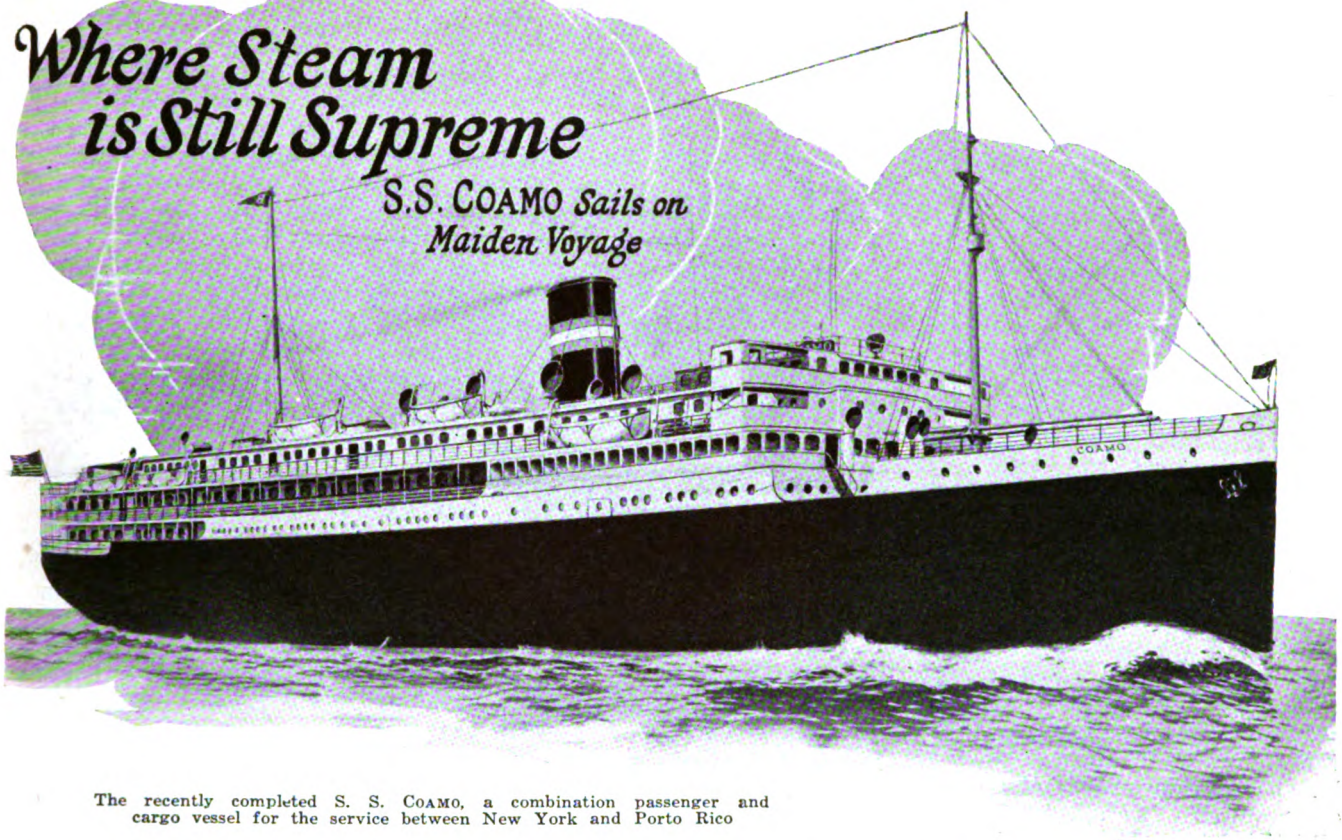
Where Steam is Still Supreme

S.S. COAMO Sails on Maiden Voyage



The recently completed S. S. COAMO, a combination passenger and cargo vessel for the service between New York and Porto Rico

ON JANUARY 7 the S. S. COAMO, the latest and in many respects the finest product of an American shipyard, sailed with a full passenger list on her maiden voyage from New York to Porto Rico. This modern combination passenger and cargo vessel, designed by Theodore E. Ferris for the New York and Porto Rico Steamship Co., was built by the Newport News Shipbuilding & Dry Dock Co., Newport News, Va. The principal dimensions are: length overall 429 feet; length between perpendiculars 412 feet; breadth molded 59 feet 6 inches; depth molded to hurricane deck 35 feet; maximum load draft 24 feet 6 inches; displacement at the designed load draft of 23 feet 6 inches, 10,400 tons; and, deadweight capacity at load draft 4100 tons.

Represents Shipbuilding at Its Best

There are six decks designated as follows: lower, main, hurricane, promenade, boat and shade decks. Accommodations have been fitted on an unusually elaborate scale for 287 first-class and 90 second-class passengers. The total cargo capacity is 237,700 cubic feet, 130,900 cubic feet of which is insulated for perishable products.

Propulsion is accomplished by means of a single screw driven by a 6000 shaft horsepower Newport News - Curtis impulse cross compound turbine through double reduction gears. The boilers, five in number, are of Scotch type, oil fired with forced draft. The sea speed is 16 knots.

An inspection of the COAMO will fully substantiate the statement of the owners that the public rooms, lounges, tea room, dining saloon, music room, deck veranda, sheltered dancing deck, library, writing room and the smoking room have been laid out with exceptional care for convenience and comfort, that they are finished in excellent taste and that the quality, design and arrangement of furniture, draperies and hangings compare favorably with the best homes and clubs. The decks are spacious and the forward portions are glass enclosed. Staterooms and cabins de luxe are particularly well planned and are finished and equipped to delight the most critical sense of comfort and refinement.

The use of teak, in doors and trim, the excellent quality of all joiner work and the regularity and neatness of all exposed steel work creates a decidedly pleasing impression of craftsmanship of high order.

Modern Steam Drive Has Advantages

But with due respect to the many excellent features of the hull construction of this vessel it is the engine and boiler rooms that are truly remarkable. It is impossible to convey a true impression of the high order of engineering skill in design and workmanship, the sense of confidence, solidity, order, neatness, coolness and certainty of performance that a personal inspection gives.

The writer was convinced from the moment he looked upon this equipment that the day of the reciprocating hand coal fired steam installation is unalterably gone even were it possible to build

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such equipment for nothing, and the day is not yet here when the reciprocating large unit bulky Diesel engine or multiple smaller units will replace machinery of the type on the COAMO. There is no doubt that among unbiased engineers of wide experience and vision a most important place is accorded the Diesel engine for marine propulsion, due to its low fuel consumption. To cut the fuel bill to 40 per cent of what it would be with the most efficient steam installation cannot be ignored. And for low powers from 100 up to 5000 horsepower, a range suitable for the smallest work boat up to the economical large fast long distance freighter, the Diesel engine has an overwhelming advantage. But for higher powers and fast passenger liners the question of the wisdom of its adoption has not been proven.

The experience which will come in the operation of larger European passenger vessels already equipped with Diesel engines, and others under construction, will be watched with the keenest interest. Vibration, flexibility, ease of operation, working conditions of the operating staff and crew, upkeep and first cost will all be taken into consideration.

Naval Court of Inquiry Holds S-51 Not at Fault

OFFICIAL findings of the naval court of inquiry, appointed by Secretary of the Navy Wilbur, place practically the entire blame for the collision between the S. S. CITY OF ROME, of the Ocean Steamship Co., Savannah, Ga., and the navy submarine S-51 on the night of Sept. 25, last, on officers and men of the merchant vessel. The collision occurred off Block Island, Rhode Island, as the CITY OF ROME was bound for Boston from Savannah. The submarine was sunk, resulting in the loss of six officers and 27 men.

The verdict of the court, composed entirely of naval and marine corps officers, was not entirely surprising, and is said in Washington to be a decision that might have been expected in a review by a naval court of a wreck between a naval and a merchant vessel. That the merchant vessel would get the bulk of the blame in the navy's record of the case was the outcome that had been indicated to those who had been interested in the investigation.

No official comment is obtainable in Washington aside from the naval court's verdict, but it has been stated unofficially that a further sifting of evidence may show that the evidence was not entirely one-sided.

Further evidence has been submitted in Boston at the hearing started there under direction of the steamboat inspection service of the bureau of navigation, which is no part of the naval inquiry. Charges were preferred against Capt. John H. Diehl, of the CITY OF ROME, and the hearing was begun in Boston early in January but was discontinued after a few days of sessions until late in the month.

The hearing of the steamboat inspection service may get closer to the actual cause of the wreck, it is stated in some quarters, than the investigation conducted by the navy department. It also is pointed out that this hearing may contain less of bias than many believe the verdict of the naval court developed.

No merchant marine representation was accorded in the naval court's inquiry. The naval court consisted of the following: Capt. O. P. Jackson, U.S.N. (who has died since the court convened); Capt. Walter M. Hunt, U.S.N., and Capt. David A. Weaver, U.S.N. Lieut. Commander Charles A. Lockwood, U.S.N. was judge advocate, and he was assisted by Capt. Leo F. S. Horan, United States marine corps. Captain Jackson was president of the court.

Serious charges were made against the CITY OF ROME. It was contended in the official findings of the court that the merchant vessel violated the rules of the road in three or four instances, and that the CITY OF ROME left the scene without placing a marker over the wreck or sending out S.O.S. calls. It was admitted, however, that the CITY OF ROME blew two groups of signal whistles, and that the merchant vessel rescued the three survivors. It was charged, however, that the merchant vessel failed to maintain an adequate lookout, but it was admitted in the findings that the S-51 was first sighted by the lookout of the merchant vessel when the submarine was several miles from the CITY OF ROME.

In case Captain Diehl is found guilty of responsibility of the collision, he may appeal his case to the district supervising inspector of the steamboat inspection service in district No. 5, at Boston and an appeal from the district supervising inspector's decision can be taken to Supervising Inspector General Dickerson N. Hoover, at Washington. Mr. Hoover will not comment upon the case, as he ultimately may be called upon to render an opinion, in case of continued appeal.

The entire record of the naval court of inquiry has been forwarded to Attorney General Sargent for action, together with recommendations from the navy department, which have not been made public.

The S-51 had left the submarine base at New London, Conn., to engage in engineering exercises, and was fully equipped and manned, with additional student officers from the New London submarine school on board.

After the collision, Captain Diehl lowered a life boat and put over life buoys, thus saving three of the submarine's crew. Attempts to raise the submarine had to be discontinued because of unfavorable weather conditions prevailing in that territory. Work will be resumed in the spring, it is announced. The naval court of inquiry convened at the navy yard in Boston on Oct. 15, and the findings were completed early in January.

More To Be Said

It is not fair to come to any hasty conclusions in so serious a matter as the sinking of the submarine S-51 by the City of Rome. The findings of the naval court places all the blame on the merchant vessel. This verdict will not be accepted by American merchant officers and steamship companies without concurrence after a thorough investigation (now under way) by the steamship inspection service.

Whitewashing of either the navy or merchant marine personnel concerned in this disaster will serve no good purpose. The absolute truth of the matter should be fixed with impartial justice so that a similar accident cannot happen again.

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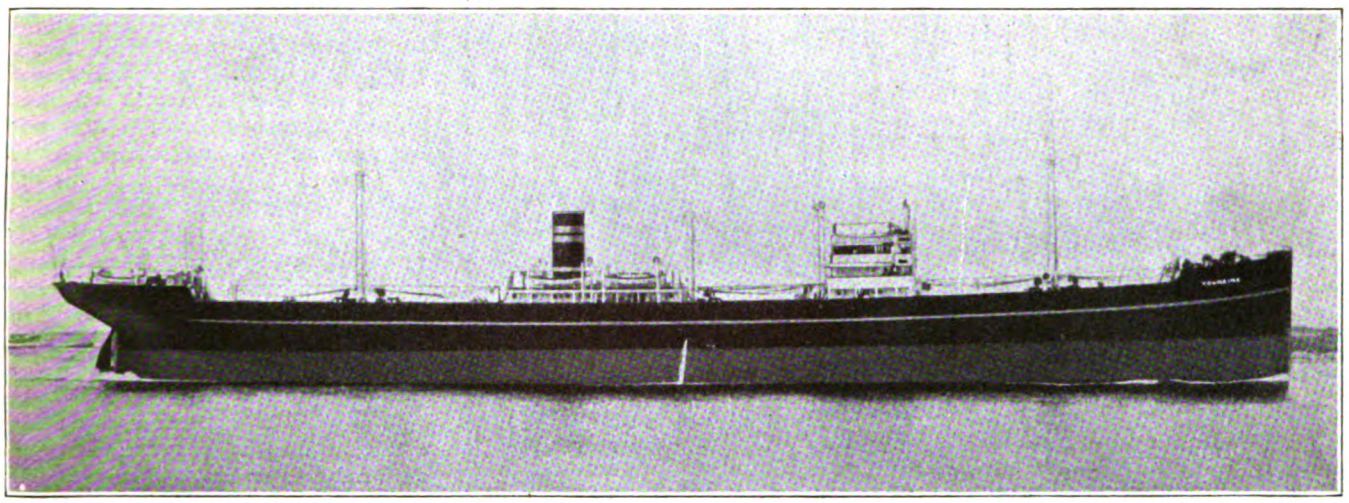
Build Fast Diesel Freighters

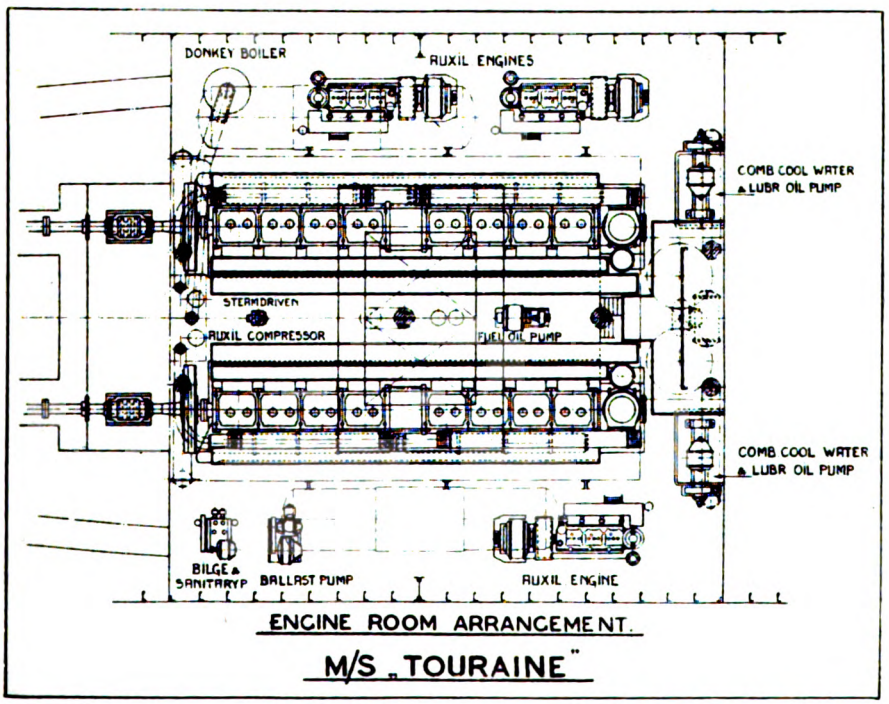
Foreign Lines Take the Lead in Building Fast Economical Cargo Ships—Keen Competition Increases Demand for 14-Knot Freighters



Twin screw M. S. Touraine built by the Odense steel shipyard for Norwegian owners—With a sea speed of 13.6 knots and a deadweight capacity of 9600 tons this vessel is a fine example of an up-to-date freighter

SERVICE improves with competition. This applies to the business of transportation by water with just as much force as to any other business and shippers all over the world, including America, are fully aware of this fact. Since there is little sentiment in good business, shippers are quick to avail themselves of the best service offered. Competition for cargoes never was keener than it is now. Freight rates are low and the tonnage offered exceeds the demand. Under such conditions the best ships, the best men and the best management alone can hope to make a profit for any steamship company. In the old days, America's preeminence upon the seas was due to these very factors; faster ships, the ablest seamen and shrewd Yankee management. The reputation for speed and seaworthiness of the American clipper ship, honestly earned, became a tremendously valuable asset in competing with the ships of other nations for cargoes in all parts of the world and it was possible not only to get the business but to get it at higher rates. This was the premium then paid for service and the American merchant marine flourished.

Human nature and the fundamental underlying principles of trade do not change much. The success of any merchant marine in the foreign trade at this time will depend upon superiority in materiel and personnel just as it always has. It therefore behooves America to wake up to the fact that other maritime nations recognizing the primary importance of superior cargo ships, are building large diesel freighters with speeds above 12 and up to 14 knots. Due to the low fuel consumption of the diesel engine these ships are economical to operate. Choice cargoes, full ships and in some cases better rates will much more than make up for the additional capital cost. In fact, these ships will at once in certain trades, and in time in all trades, simply make the 10 to 11 knot steam freighter (the typical American freight ship) obsolete. Furthermore, the few American diesel cargo ships now in existence and the 14 being converted from steam to diesel by the United States



ENGINE ROOM ARRANGEMENT.

M/S „TOURAINE"

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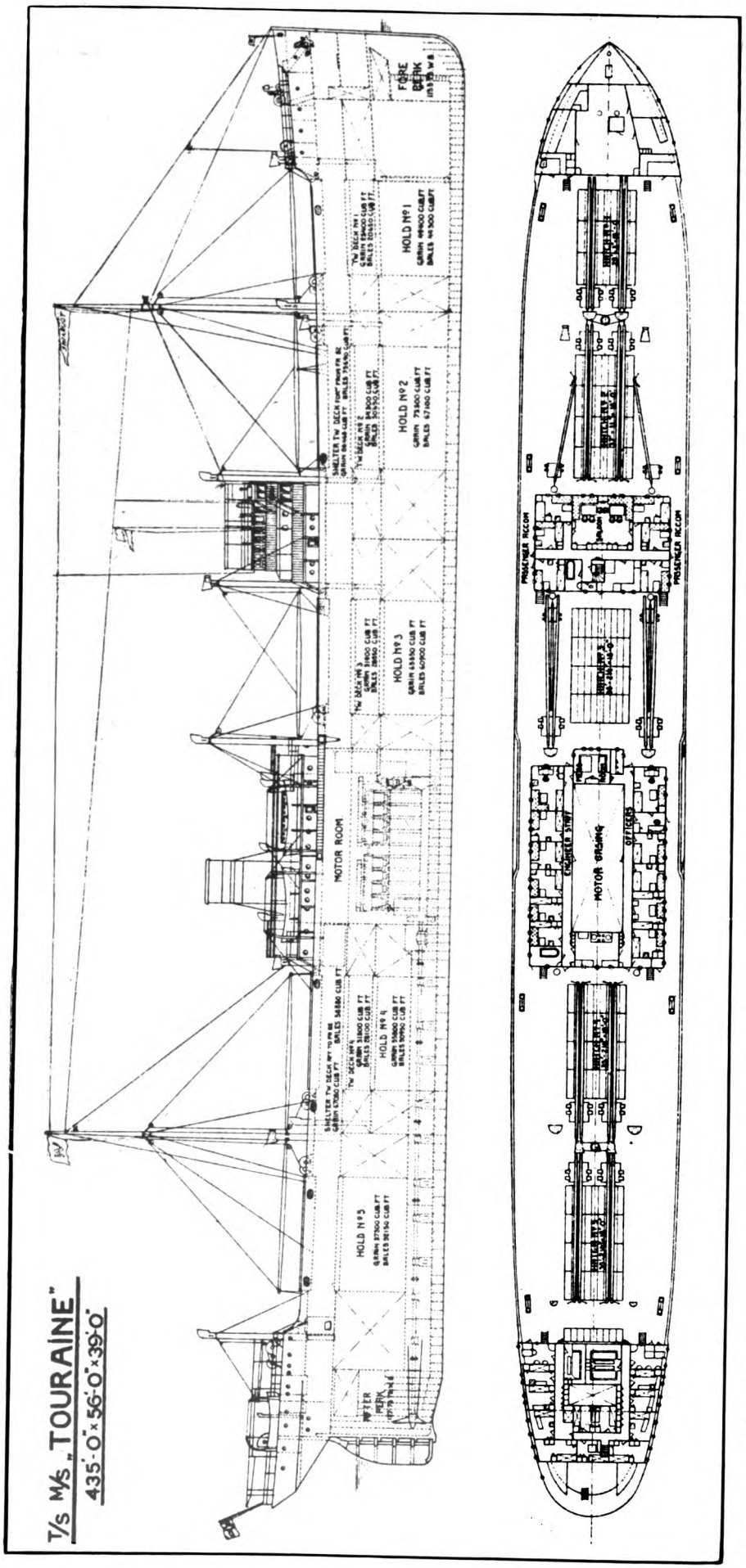

shipping board, though presumably superior to steamships, will not be of any greater speed and will therefore be distinctly second rate in comparison with the latest European diesel ships.

This condition of affairs is of serious moment to the immediate future of our merchant marine. American diesel engine builders should prepare to furnish the necessarily greater powers needed and a compromise in speed must not be made to suit standardized designs of engines of insufficient power. In other words, the vessel must not be built around the only readily available engine a manufacturer is at present particularly fitted to turn out. The diesel engine builder must have in mind a range of standardized engines which singly or in pairs will with the appropriate hull be suitable to give a high speed freighter of modern type.

It is with the view of concentrating attention on the progress European nations are making in modernizing their merchant marine that the accompanying illustrations and the following details of construction of the TOURAINE, a recently completed foreign twin screw Diesel ship is presented.

Twin Screw Motorship Touraine

The Wilh. Wilhelmsen Lines, Oslo, Norway, some time ago ordered three 9600 tons motorships from the Odense Steel Shipyard. The first of these three sister ships was the M. S. TOURCOING which has been in service since October last, and the second ship, the M. S. TOURAINE, has been completed, ran her successful trials and is now in service. The principal dimensions of the ship are as follows:

Length between p. p. ft. ins.	435—0
Beam, ft. ins.	56—0
Depth to maindeck, ft. ins.	30—6
Draft, loaded, ft. ins.	28—0
Gross tonnage, tons	5843
Deadweight in tons	9600
Capacity in grain, cu. ft.	586,950
Capacity in bales, cu. ft.	528,685
Fuel oil capacity, in tons	1410
Speed at sea, knots	13.6

Constructed to British Lloyds class 100 A.I., of open shelterdeck type with freeboard and strengthened for loading down to 28 feet with closed tonnage openings, the TOURAINE has three complete steel decks with exception of the aft hold, where a deep tank for oil is fitted. The decks are supported by a system of girders and pillars with great distance allowing a convenient handling of the cargo in the holds. The engine room is located amidships with three holds forward and two

(*Continued on Page* 54)

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New Welland Ship Canal Is Now More Than Half Completed

Welland Ship Canal Lower Entrance Lock No. 1 Taken July 8, 1925

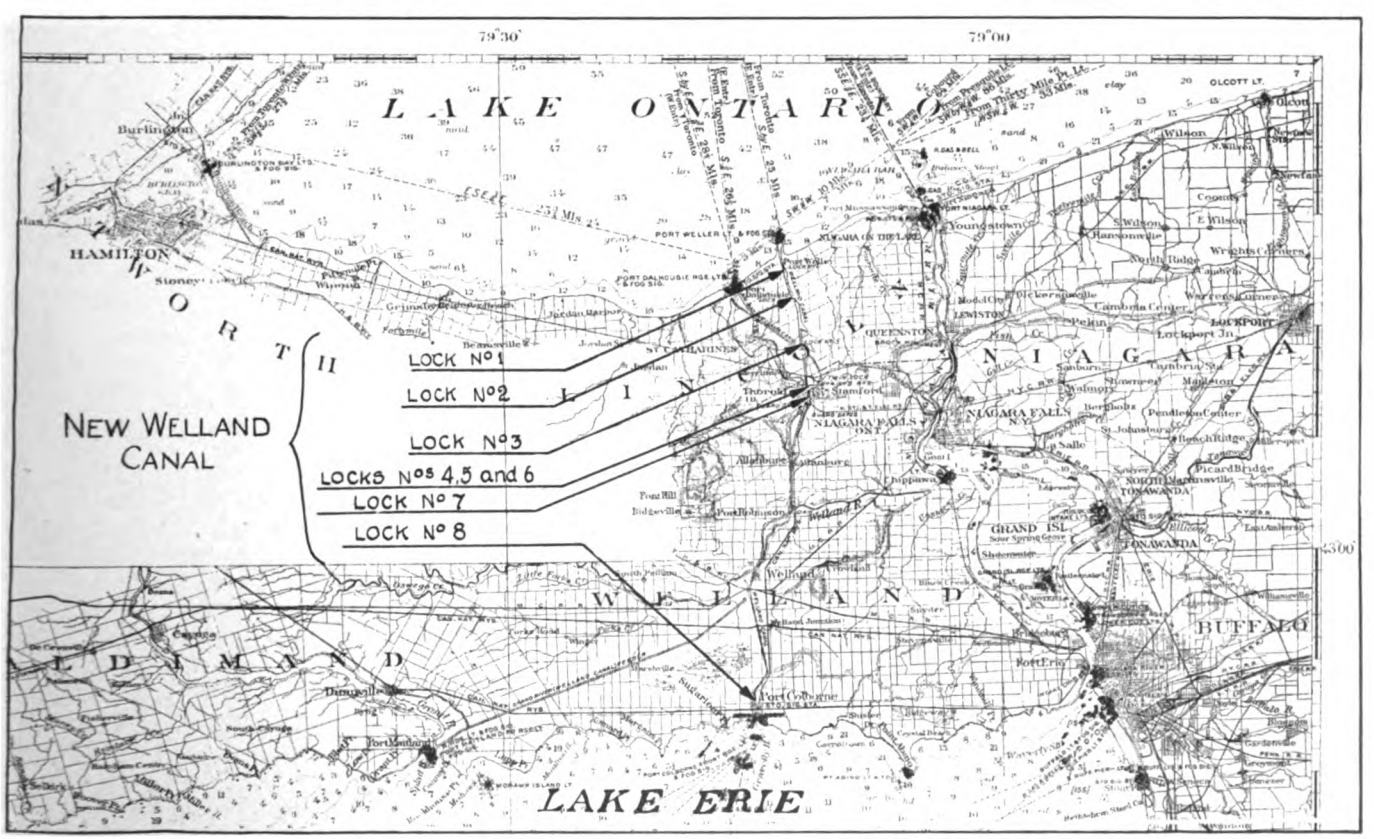
HOW is the new Welland ship canal between Lakes Erie and Ontario coming along? Are the Canadians prosecuting the work with vigor? When will it be completed? The facts upon which this article is based and the illustrations accompanying it were obtained directly from Alex J. Grant, engineer-in-charge, for the Canadian government. It is estimated that the cost of this gigantic project complete will be $75,000,000. American vessels will use it free of all tolls on an absolute equality with Canadians.

THE Welland ship canal, connecting Lake Erie with Lake Ontario, will be the fourth canal to be built since the first undertaking was commenced in 1824. The present canal, with its twenty-six locks, each 270 feet long by 45 feet wide, with 14-foot draft, will be replaced by the new ship canal, with seven locks, 859 feet long by 80 feet wide, with 30-foot draft. Each lock will have a lift of 46½ feet, with an additional lock at Port Colborne, 1380 feet long, by 80 feet wide, 30-foot draft, and a lift of zero to 11 feet, depending on the level of Lake Erie. Time in transit will be reduced from 13 hours via the present canal to 4 hours when the new canal is completed.

The contractors for the construction of the Welland ship canal are: J. P. Porter for sections 1 and 2; P. Lyall and Sons Construction Co., for sections 3 and 4; Canadian Dredging Co., for section 5; Atlas Construction Co. and E. O. Leahey for section 6; Canadian Dredging Co. for section 7; and A. W. Robertson, Ltd., section 8.

At Port Weller, the Lake Ontario

(*Continued on Page* 42)



Map showing location of the new Welland ship canal between Port Colborne, Lake Erie and Port Weller, Lake Ontario

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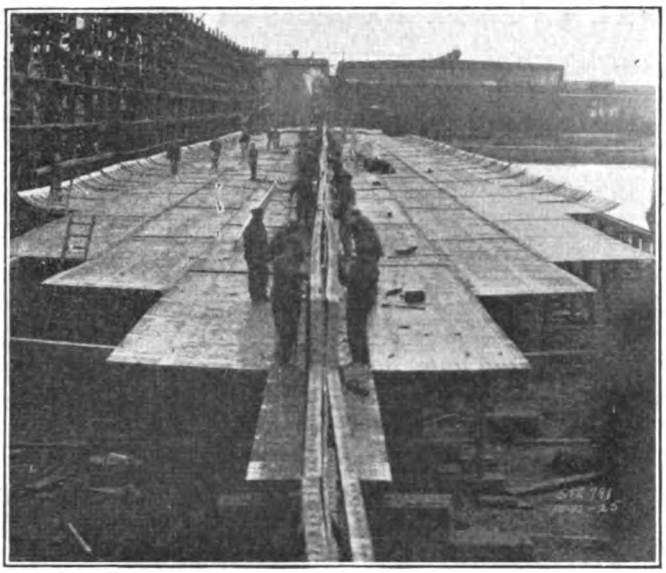
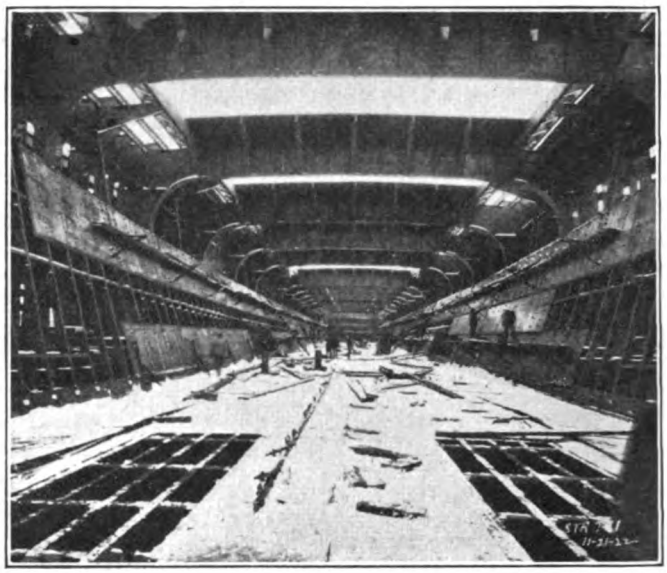
Building the S. S. Col. James Pickands

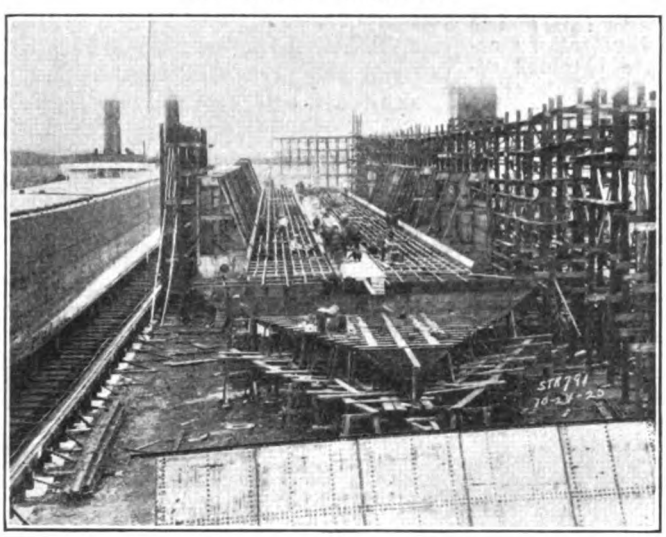
Keel Laid Oct. 12, 1925—Launched Jan. 16, 1926



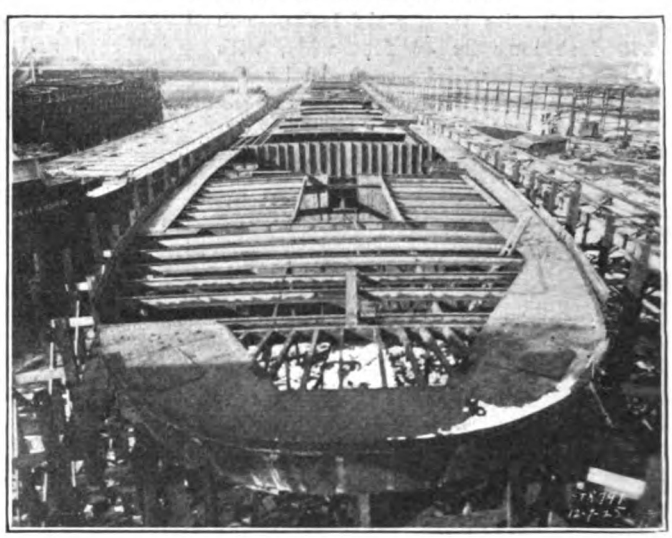
OCT. 12, 1925—KEEL LAID



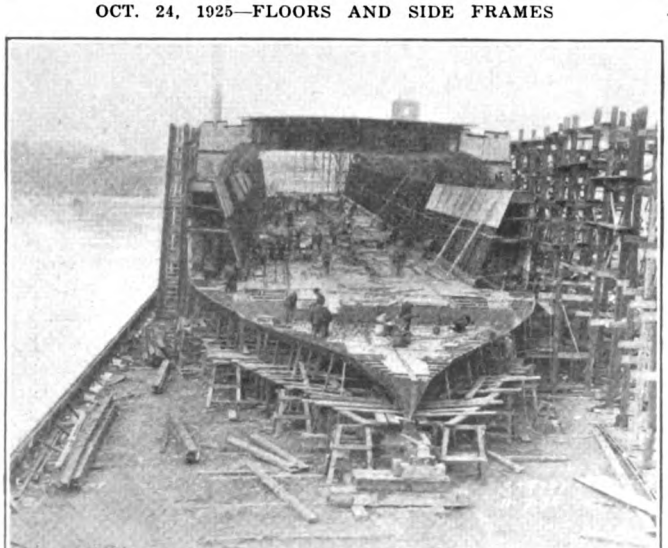
NOV. 21, 1925—INTERIOR VIEW



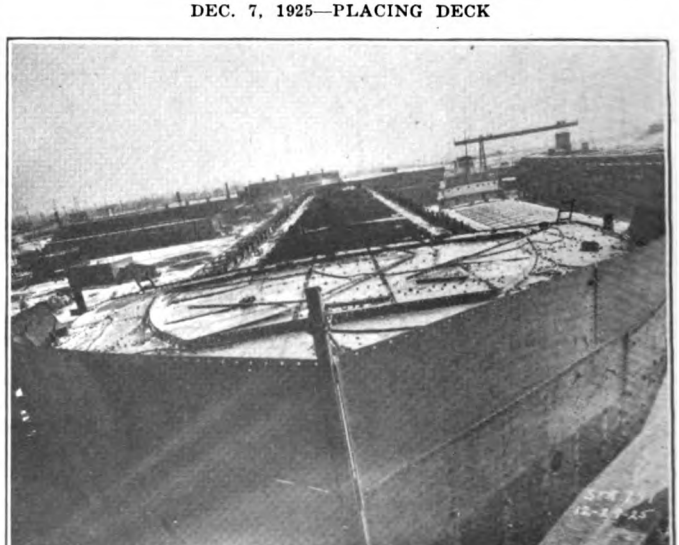
OCT. 24, 1925—FLOORS AND SIDE FRAMES



DEC. 7, 1925—PLACING DECK



NOV. 7, 1925—TANK TOP AND ARCHES



DEC. 29, 1925—PLATED AND DECKED

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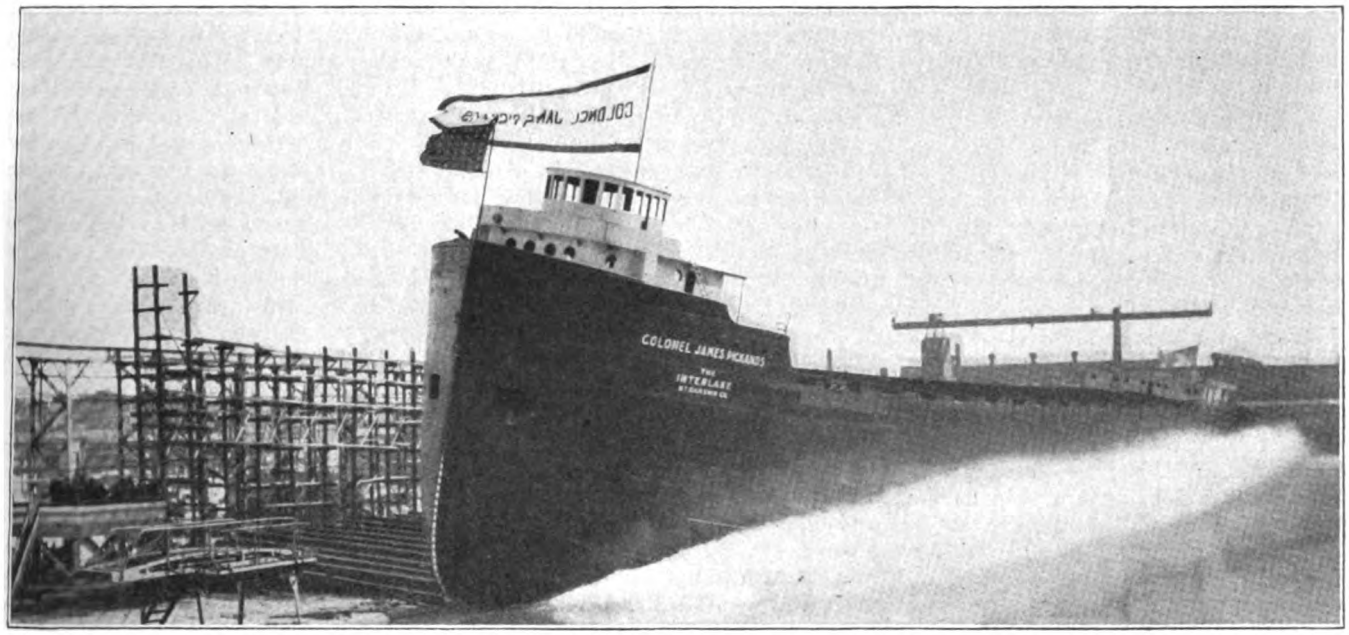

Jan. 16, 1926—Launching the COL. JAMES PICKANDS at the Lorain, O. plant of the American Ship Building Co.

Launch S. S. Col. James Pickands

New Vessel is Similar to the S. S. Charles M. Schwab—But Will Incorporate Improvements to Increase Efficiency of Steam Plant

THE American Shipbuilding Co.'s Lorain plant laid the keel of the steamer COL. JAMES PICKANDS on Oct. 12, 1925, and this vessel was launched Jan. 16, 1926. Concurrent with the work on the PICKANDS a duplicate steamer the SAMUEL MATHER has been carried along so that the latter, it is now expected, will be launched on Feb. 6. The accompanying illustrations show the progress made in "building the ship" from laying of keel to launching.

S. S. Col. James Pickands Particulars

Owner—Interlake Steamship Co.
Builder—American Ship Building Co.
Launched—Jan. 16, 1926 at Lorain, O.
Classification—American Bureau Shipping.

HULL

Length Overall—600 feet; length between perpendiculars, 580 feet; breadth molded, 60 feet; depth molded, 32 feet; draft loaded in fresh water, 20 feet; displacement to load draft, 17,000 tons (2240 pounds to ton); gross tonnage, about 7900; net tonnage, about 6200; cargo capacity, in cubic feet 546,000, in long tons about 11,500; bunker capacity, coal, 500 tons @ 40 cubic feet per ton; speed loaded 12.3 statute miles per hour.

MAIN MACHINERY

Main Engine—One triple expansion reciprocating steam engine built by the American Ship Building Co. Size 24½ x 41 x 65 inches in diameter and 42 inches stroke. To develop 2300 horsepower. Boilers—Three, Babcock & Wilcox marine watertube boilers; working pressure 200 pounds per square inch; superheaters for 50 degrees Fahr.; superheating surface, 6675 square feet, fuel, coal.

AUXILIARIES

Condenser—One surface condenser made by Wheeler Condenser & Engineering Co.; distiller, Griscom Russel; filters, 50 gallons capacity, feed water heater, 40,000 pounds capacity of Reilly type—**Pumps**—Two main ballast 14-inch Morrison centrifugal, one circulating 9 x 9 x 12 inches made by Morris Co., two auxiliary ballast 8 x 12 x 14 inches duplex vertical Warren; one main feed, a Warren sink plunger type 14 x 7 x 16 inches; one auxiliary feed or general service horizontal duplex 12 x 6 x 12 inches; one water pump, 7½ x 5 x 6 inches of duplex plunger type; one sanitary, 6¼ x 6 inches piston duplex type; the remainder are listed: One 5¼ x 4¾ x 5 inches h. d. water, one 3 x 2 x 3 inches drinking water, two 3 x 2 x 3 inches oil to thrust bearing, one 6 x 6 x 6 inches condensate pump, two steam jet air pumps, one 5 x 13¼ inches attached bilge, on 3½ x 13¼ inches attached cooler and one 4½ x 3¾ x 4 inches lift pump. **Refrigeration**—Motor driven 2-ton ice machine, Ohio Refrigerator Co. **Electric Generator**—two 15 kilowatts and one 7½ kilowatts of Engberg make. **Steering Gear**—a standard double 9 x 9 inches engine direct connected to cast steel quadrant, controlled from the pilot house by line shafting running in roller bearings. **Windlass**—American Ship Building Co.'s 10 x 10 inches spur geared type with cast steel teeth machine cut. **Winches**—Five deck winches, 8 x 10 inches, one 8 x 10 inches and two 6 x 6 inches hatch winches. **Life saving equipment**—two metallic life boats 22 feet long. **Anchor Chain**—National Malleable cast steel 2¼ inches stud link. **Gyro Compass**—The Sperry Gyroscope Co., Brooklyn, N. Y. **Submarine Signal**—Submarine Signal Co., Boston.

The steamers COL. JAMES PICKANDS and SAMUEL MATHER are being built for the Interlake Steamship Co., Cleveland, next to the Pittsburgh Steamship Co. the largest ship owners on the Great Lakes. With the addition at the opening of navigation of the two new steamers this company will possess 50 vessels engaged in the ore and coal carrying trade. Christened by Miss Caroline O. Pickands, daughter of Mr. and Mrs. Henry S. Pickands, the steamer COL. JAMES PICKANDS, named in honor of the sponsor's grandfather, was the first American vessel launched on the Great Lakes in 1926.

Similar to Charles M. Schwab

In dimensions, general arrangement of hull and in many details of her machinery the new vessel will be practically a duplicate of the CHARLES M. SCHWAB built for the Interlake Steamship Co. at the Cleveland plant of the American Shipbuilding Co. in 1923. Certain details of hull and machinery are given in this article grouped together for convenient reference. Constructed on the arch or deep girder principal with sloping side tanks extending from tank top to main deck all stanchions and hold beams are eliminated from the cargo space giving free open smooth holds. Two screen bulkheads divide the cargo space into three compartments. There is a collision bulkhead and an after hold and after peak bulkhead, all of which are of watertight construction. The cargo hold measures about 438 feet in length.

Divided into 16 watertight compartments, a double bottom is fitted throughout the length of the vessel. Under the cargo space it is 5 feet 6 inches deep and under the machinery space it is 4 feet 6 inches deep. To give ample strength and at the same time to avoid deep webs

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a combination of the longitudinal system for the double bottom and transverse framing above the tank top has been adopted.

A Great Lakes bulk ore carrier appears to be practically all holds and hatches. In the arrangement of hatches the COL. JAMES PICKANDS is a duplicate of the CHARLES M. SCHWAB in which the innovation was made of spacing the hatches 24 feet between centers. There are 18 cargo hatches in all, each 12 feet long in a fore and aft direction and 38 feet wide athwartship. A much stronger construction throughout is possible with this greater distance between hatches and it has not been inconvenient in unloading the ship as the latest type of unloaders have ample radius of action.

Better Steaming Efficiency

The main engine and many of the auxiliaries are also duplicates of the SCHWAB. In two very important items in the power plant however a progressive step forward has been taken. The main engine low pressure cylinder will exhaust into a proper sized surface condenser. Conditions of vacuum and heat conservation (by so much enhancing the efficiency of the main engine) will be quite equal to those on a modern ocean freighter with the same type of machinery. Instead of the Scotch type of boilers, Babcock & Wilcox marine water tube boilers with 200 pounds working pressure and 50 degrees F. of superheat will be used. To go a step farther in an earnest attempt to increase the efficiency without departing from the customary type of lake vessel, it might be possible to gain a great deal in efficiency by burning the coal in a more economical way. A practical method of burning pulverized coal would increase steam per pound of coal and would eliminate firemen.

There are several interesting details in connection with the machinery on the steamer COL. JAMES PICKANDS. The surface condenser for the main engine is provided with two steam jets for air ejection and one tail or wet pump for condensate. A feed and filter tank is also furnished. This amounts to an independent pumping outfit which can be used in port or when the vessel is maneuvering.

The usual seven collar horseshoe thrust bearing is used, which runs in an oil bath and in addition is lubricated by an independent oil pump forcing in oil at 40 pounds pressure between collars and shoe, which is about the pressure on the driving surfaces. The collars are water cooled inside. The stern tube is of heavy cast iron made, in accordance with the American Shipbuilding Co.'s practice, funnel shaped, to facilitate removal of the tail shaft inboard for repairs.

The main ballast pumps are each capable of discharging 6000 gallons per minute. Water ballast on the Lakes has to be handled very quickly and the water bottom and side tanks in this ship, totaling 8715 net tons, can be discharged in about four hours. In extreme weather, when the ship is light, the cargo hold can also be flooded and used as ballast. Two 8-inch filling and suction pipes are connected to the main hold.

The propeller is of the sectional type of cast iron 15 feet in diameter and 14 feet in pitch.

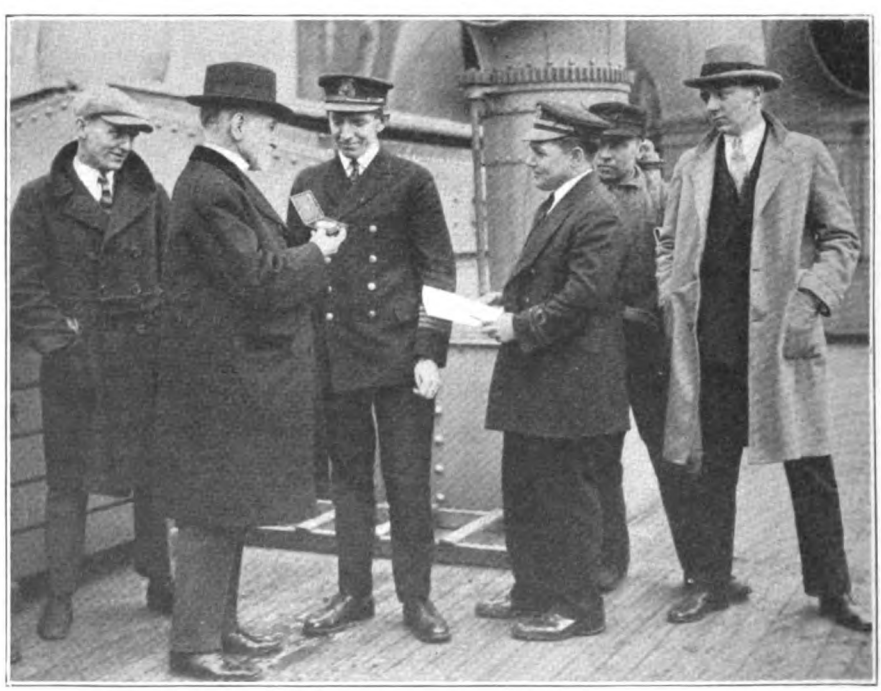
Sperry Opens Schools on Great Lakes

In order to meet the rapidly growing demand for authentic knowledge regarding the care, operation and underlying principles of the gyro-compass, the Sperry Gyroscope Co., Brooklyn, N. Y., is conducting special schools on the Great Lakes this winter. These schools will be fitted with equipment similar to the type which is being so rapidly adopted in that district as indicated by the fact that over 40 sets will be installed during the winter.

Attendance will be limited to captains whose ships are to receive gyro-compasses this winter and to other masters by special enrollment. One school is in Marine City, Mich., and the other in Cleveland.

Honor Captain and Crew of American Trader

THE officers and crew of the AMERICAN TRADER *which rescued the crew of the Norwegian steamer* ELVEN *in mid-Atlantic on Oct.* 26, 1925, *received medals and purses of money aboard their ship the afternoon of Jan.* 13. *Capt. H. Fish and Second Officer Warren Woodman received gold medals, and seven members of the crew received bronze medals and* $50 *in gold. Captain Fish receiving the gold medal from Cornelius Eldert, president of the Life Saving association, while Mr. Woodman looks on.*



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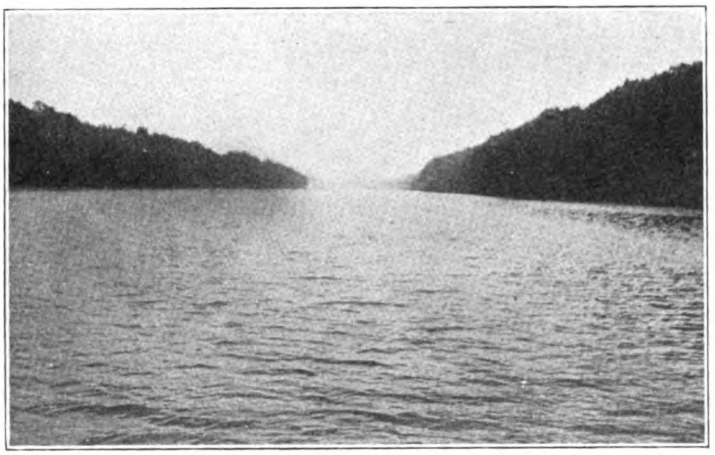
AN AMERICAN waterway from the Great Lakes to the Atlantic seaboard is an economic necessity. The comparatively short restricted sections of the existing New York Barge canal should be deepened to 14 feet and widened to 125 feet, to make it practicable.



Oswego River Section of the Canal

SELF-propelled boats of 2500 tons capacity capable of operating ocean coastwise and on the Lakes could then be used for the through shipment of domestic freight and as feeders for foreign traffic. The canal would thus become a great avenue of commerce.

Deepen and Widen Restricted *Sections of New York Barge Canal*

BY W. S. FALLON

THE success of the American merchant marine, the growth of our foreign trade and the trend and development of our industries will in an ever increasing measure depend upon the economic utility of our waterways and our ports and terminals in serving the owners and carriers of the materials bought and sold and transported in world commerce. For in the final analysis everyone carries on in the hope of profit, and no mere words of encouragement, laws, patriotism or any other immaterial thing can long serve as a substitute.

Owing to the greater distance of average land haul and the lack of adequate inland water transportation, which is the natural feeder of ocean commerce, American exports when placed aboard ship carry a transportation charge twice that borne by freight accumulated for export in European ports. This together with the greater overhead of investment and repairs, more men per ship, higher maintenance and wages, produces a condition, that if it cannot be remedied or overcome, will again reduce ships under the American flag to that minimum dictated by absolute domestic necessity.

United Effort Needed

All shipping men realize this condition but it is beyond their power to remedy. The experience of every maritime nation has proven that these necessary things can only be accomplished by co-operative community effort. Wherein each community desiring the benefits must contribute to, and strive for the success of a fixed national policy. Each community doing its part, by building an efficient port, contributes a unit necessary to the welfare of the whole. By so doing markets are broadened; investments are made more productive, permanent and secure, and labor is thus enabled to produce more with less expenditure of time and energy. This principle applied to industry has kept our products in the markets of the world in competition against low capital costs and cheap labor, and no other solution for the problems of our merchant marine seems practical.

When it is proposed that a community with water transportation possibilities devote a part of its energy and wealth toward the advancement of this policy and a proper development of its natural advantages, questions naturally arise in the minds of those who must pay. Does there exist or can there be provided a satisfactory seaway, or trade route to a desirable market? Will the operator and shipper use the waterways and harbors provided? Will the increase in industry, savings and profit justify the expense? What constitutes a desirable development and how is it to be paid for?

In general the American waterways policy has consisted of developing and maintaining channels in and around recognized harbors; providing adequate draft in the connecting waterways of the Great Lakes with an outlet to the ocean; the development of the Mississippi system between the Gulf of Mexico and the Great Lakes at Chicago, and the tributary Ohio waterways up to the vicinity of Pittsburgh with its connecting system to Lake Erie.

Waterways—Lakes to the Sea

There is at present two recognized waterways between the Great Lakes and the Atlantic ocean over which commerce is carried in ships. One via the St. Lawrence waterways and the other via the New York State canals. Both are inadequate and their improvement is being considered. As to which one should be promoted as the main outlet for the commerce of the

(*Continued on Page* 36)

An American Ship Canal

In addition to the immediate practical steps recommended in this article, to deepen and widen the present restricted portions of the Barge canal so that vessels of economic size may be used in through traffic from any port on the Great Lakes to any port on the Atlantic seaboard, a comprehensive plan should be worked out to continue its improvement with the ultimate aim of making this waterway a ship canal with an allowable draft of 24 feet.

The plan to make the Hudson river navigable for ocean vessels all the way to Albany has been approved and this work will be carried through by the national government. This project should be continued from Albany to the Great Lakes.

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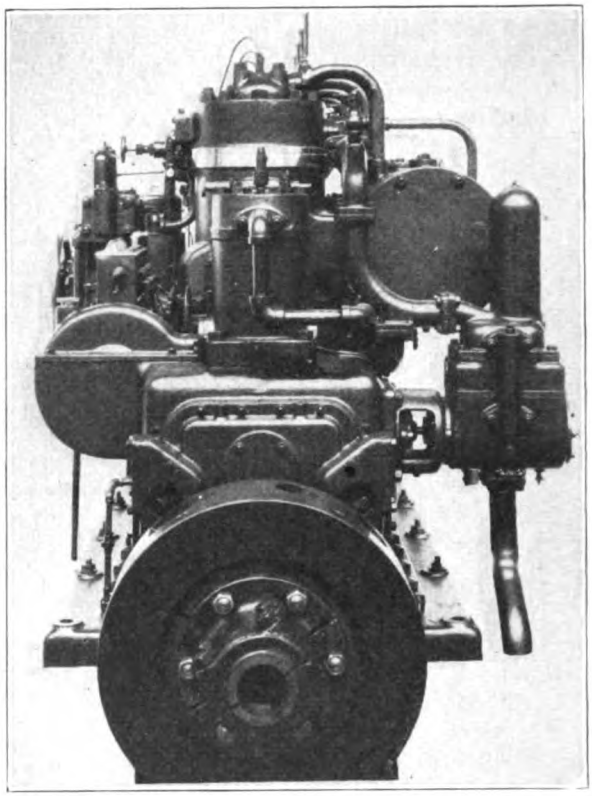
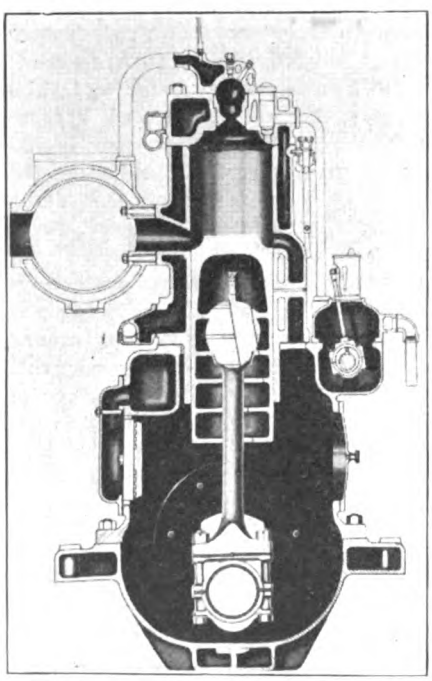
Improved Marine Diesel *Is* Simple in Design *and* Dependable in Operation

BY R. H. BACON



Aft end of new Fairbanks, Morse Marine Diesel Engine—Built in starboard and port models for twin installations—View shown is of a starboard model—The Air Compressor is shown in the foreground—Circulating pump is at the right

IN THE selection of an engine for a boat there are two major factors which must receive careful consideration. The first of these is the over all cost of operation, and the second is the dependability of the particular type of power which is to be used. The diesel engine has shown that it will operate at a very low fuel and labor cost but there is still a doubt in the minds of some boat owners as to whether the Diesel engine can be counted upon to operate year after year without loss of time or without high maintenance costs. Without dependability, low fuel consumption and a minimum personnel are not of much value, for the cost of a few service interruptions will offset any gain in reduced operating costs. As a matter of fact, however, a high grade Diesel engine is an extremely dependable machine. The maintenance costs are low and the life of the equipment is long. When the diesel engine was first developed, and during the early years of its use, some mechanical troubles were experienced. Such failures, however, are matters of history. The improvements in diesel engine design and manufacture have been fully as great as in the automobile engine and it is as unfair to compare the present day marine oil engines with the early types as it would be to compare the modern automobiles with those of an early era.



SECTIONAL VIEW OF THE NEW TYPE FAIRBANKS, MORSE & CO. DIESEL ENGINE FOR MARINE SERVICE

R. H. Bacon is a member of the staff of the Diesel Engine division of Fairbanks, Morse & Co., Chicago.

Two Cycle-Solid Injection

One of the advances which have been made in diesel engine practice has been in the development of the two cycle airless injection type on account of the mechanical and operating simplicity of this design. The four cycle engine requires both inlet and exhaust valves, which require care in setting to produce the best efficiency and they must be frequently ground in order to keep the engine in good operating condition. Low grades of fuel oil, particularly those of a heavy sticky consistency, and those containing a considerable sulphur content, cause trouble with the valves due to carbon or corrosion.

The early diesel engines also required the use of high pressure air for atomizing the fuel and this further complicated the construction. A multiple stage air compressor, which was necessary to furnish this high pressure air, added another feature of equipment to be looked after and the adjustment of the amount of air injected with the fuel required considerable care. The air injection engine has, of course, been improved in its mechanical design and is being used successfully, particularly in connection with large diesel engines. Both in this country and abroad, however, the trend has been distinctly toward the development of two cycle airless injection types and it appears that the engine of the future, even in the larger sizes, will be of this type.

Simplicity A Big Factor

In order to understand the reasons which lie back of the simplicity of the two cycle airless injection diesel engine, it is necessary to have some idea as to how this type operates. The marine diesel engine, which has recently been developed by Fairbanks, Morse & Co., is an example of a late

(*Continued on Page* 50)

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Keep the Great Lakes Intact

Chicago Must Stop Draining Them

CHARACTERIZING Chicago as a "civic outlaw," a "bandit municipality," as "human but illogical," the tenor of the speeches at the convention of the Great Lakes Harbors association, held on Jan. 14 and 15 at the Hotel Statler, Detroit, to discuss ways and means of preventing the continuation of the diversion through the Chicago drainage canal of 10,000 cubic feet of water per second from Lake Michigan, was distinctly militant and boded ill for the easy nonchalance and mockery of law and the rights of neighboring lake cities and states and Canada, exhibited by the great western metropolis. William George Bruce, president of the association, reviewed the entire lake level situation. Harvey D. Goulder spoke on the legal aspects of the diversion case, Herman L. Ekern, attorney general of Wisconsin, discussed Chicago's financial ability to meet the sewage situation by means other than the dilution system, Newton D. Baker spoke upon the Great Lakes as a national asset, Daniel Hoan, mayor of Milwaukee, presented views on the sanitation problem and its solution, Francis King, Kingston, Ont. spoke on the Canadian side of the question, and Frank H. Keefer on where Canada stands, both presenting the Canadian view to the conference. Representative Guy L. Shaw of Beardstown, Ill., told of the opposition of the Illinois river district to the drainage canal. No representative of Chicago was present.

Low Levels Cause Great Loss

It was brought out in a discussion following Mr. Bruce's address that the level of all the Great Lakes had been lowered, doing very serious damage to shipping at Milwaukee, Green Bay, Duluth, Fort William, Port Arthur and other lake ports. In some places docks and wharves had been rendered useless and in others, boats could be loaded to but half their capacity. L. C. Sabin, vice president of the Lake Carriers' association, and formerly chief engineer of the Soo canal, said that the diversion of water through the drainage canal at Chicago was responsible for the lowering of the levels of Lakes Michigan and Huron by 6 inches. Lake Erie, Mr. Sabin said, was lowered about 2¼ inches by the Welland canal and about 1¼ inches by the Niagara Falls development. He said that all artificial losses are lowering Lakes Michigan and Huron from 11 to 15 inches leaving nearly 2 feet to be accounted for by natural causes. Present indications point to less depth in the Lakes this year than last, based on the fact that the mean level last December was lower than a year ago. Mr. Sabin made four recommendations as follows:

1. Immediate stopping of the diversion of lake water to other watersheds, at least to the lowest point compatible with the public health.
2. Building of regulating and compensating works, after careful investigation and planning.
3. Deepening of channels for immediate effect.
4. Deepening of harbors to cure present evils and also to protect against overflow when natural conditions swing back, as he predicted they would.

Officers

Great Lakes Harbors Association

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Wm. George Bruce, Milwaukee

Vice Presidents

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J. A. Scott, Duluth, Minn.
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Jos. Gibbons, Toronto, Ont.
H. S. Wells, De Pere, Wis.
Martin Georgensen, Manitowoc, Wis.
Thos. J. Green, Sault Ste. Marie, Mich.
Daniel W. Hoan, Milwaukee, Wis.
Herman Shuelke, Sheboygan, Wis.
A. H. Ferbert, Cleveland
R. K. Ramsey, Sandusky, O.
Frank L. Garner, Ashtabula, O.

Relations With Canada

Relations with Canada and her undoubted rights in preserving the Great Lakes in their natural state was stressed by Newton D. Baker. Referring to the importance of water power and unimpaired navigation he said:

"To decrease the ultimate availability of the water in the St. Lawrence valley for waterpower would endanger the economic futures of the United States and Canada.

"The United States is the steel center of the world, because there is no place in the world where iron and steel are so available at once as in the Pittsburgh district. Lake transportation has made that situation possible. If we imperil that transportation, we are in danger of committing economic suicide. Even the best interests of Chicago demand that transportation be not imperilled."

Harvey D. Goulder, for many years counsel for the Lake Carriers and the chief figure in the case on appeal before the Supreme Court a year ago which was decided against the sanitary district of Chicago in upholding the decision of Judge Landis that the diversion in excess of 4167 cubic feet per second temporarily allowed by the secretary of war was unlawful and that an injunction restraining Chicago should be issued, reviewed the legal battle to keep Chicago from "hogging" Great Lakes water. He also pointed out that Chicago had now shifted her defense from the ground of sanitation to that of navigation from the Great Lakes to the Gulf via the Mississippi river, in order to attach the support of the Mississippi valley states.

Canadian representatives suggested that their country's rights as recognized in the treaty of 1916 between Canada and the United States, should be emphasized in an appeal which will soon be taken to the attorney-general to obtain aggressive action on the part of the federal government to make Chicago live within the law. Francis King, counsel for the Dominion Marine association, said, "The government at Washington knows that Canada is opposed not only to a diversion of 4167 cubic feet per second (the amount permitted by the war department) but to any diversion whatever."

Status of Legal Steps

Herman L. Ekern, attorney general of Wisconsin, reviewed the status of the suit as brought by Wisconsin, Minnesota, Ohio and Pennsylvania to stop the illegal diversion of water as follows:

"The Supreme Court of the United States, in October, 1925, granted the order asked for by the state of Wisconsin, to be allowed to amend its complaint because of the decision of Jan. 5, 1925, in favor of the government and against the sanitary district,

(*Continued on Page* 58)

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From the Old Log Book

Stray Items About the Great Lakes, Atlantic, Pacific and Gulf Coasts and Inland Rivers from MARINE REVIEW Files of 10, 20, 30 and 42 Years Ago

FEBRUARY, 1884

THAT we have for a long time lacked a variety of types of ships in our merchant marine is brought out vividly in an item published in the *Marine Record* (then the name of MARINE REVIEW and a weekly) for Feb. 14. 1884. An American party of scientific explorers were icebound in the Arctic regions. It was stated that unless speedy relief was afforded, the members of the expedition were likely to perish. It was also pointed out that the country maintained a naval establishment at a considerable expense and that when it became necessary to send a vessel of relief, no suitable ship could be found. Furthermore, such a suitable ship was finally found in the British mercantile marine fleet. Two vessels were purchased from the British mercantile marine and a third vessel was secured from the British Admiralty.

* * *

It is in times of stress and need that the vital necessity of a well rounded merchant marine becomes clear. Time and time again in emergencies within the last forty-two years, the lack of an adequate merchant marine has been sorely felt. All of this simply points to the fact that our government should take every proper and legitimate step to encourage our merchant marine and merchant shipbuilding.

* * *

The *Marine Record* for February, 1884 points out that yellow pine boards placed in a Mullford, Pa. house 160 years ago as flooring are still doing duty in that capacity, going on to say that it is probably the oldest manufactured lumber in the United States in actual use. If it is still in use it would be over 200 years old.

FEBRUARY, 1896

PRESIDENT J. J. H. BROWN of the Lake Carriers' association of thirty years ago, in commenting upon a copy of the *Detroit Evening News* of Jan. 31, 1896 which someone had mailed to him and which contained a striking illustration of a bridge dedicated to the Hog Carriers' association, declared that the name was new to him but that it was suggestive of a railroad combination which, admiring the success of the Lake Carriers' association, had come as near imitating the name as they dared. In this case, as President Brown pointed out, imitation was the sincerest flattery and the design perfectly illustrated the position of the Michigan Central railroad on the Detroit river bridge question.

* * *

It is fortunate for navigation on the Great Lakes that obstructions in the nature of low level bridges have not been permitted to interfere with the free course of shipping. If ever the time comes when it may be necssary to build a bridge, it can be taken for granted that such a structure will be of a type of construction which will not restrict navigation.

* * *

The name "Plant" has been all but forgotten in present day steamship circles. Thirty years ago, however, the Plant Investment Co. operated an extensive system of steamship lines, railways and hotels around the Florida coast between Port Tampa and Cuba. An illustrated account is given in the Feb. 6, 1896 number of Marine Review of the launching of the Grand Duchess at the Newport News Shipbuilding & Dry Dock Co.

FEBRUARY, 1906

INTERESTING pictures of the early stages of construction of the great 25-knot Cunarders then building at the yard of Swan, Hunter and Wigham Richardson, Ltd., were published in the MARINE REVIEW twenty years ago. The pricipal dimensions of the vessels, as recorded, were 785 feet over all, 88 feet in beam and 60 feet 6 inches in molded depth. Accommodations, it was stated, were to be provided for 2200 passengers and 800 crew. The propelling machinery was to be of the Parsons Marine Steam Turbine Co. type. Four turbines were to drive four shafts. It was pointed out that the vessels and machinery were being constructed under an agreement with the British government to attain a sea speed of not less than 24½ knots which meant that the distance between Queenstown and Sandy Hook could be made in five days.

* * *

The vessels mentioned in this account have long been famous as the MAURETANIA *and the ill-fated* LUSITANIA. *The anticipation of speed was more than realized and the* MAURETANIA *today holds the fastest record across the Atlantic in either direction. Continuous service over such a comparatively long period of time and continuously holding the record for speed speaks well for the theoretical and practical skill of the British in shipbuilding.*

FEBRUARY, 1916

THE effects of the Great War in Europe were plainly reflected in the greatly increased shipbuilding activities in the United States. This is very clearly indicated in the MARINE REVIEW of ten years ago. It was stated in an article at that time that modern shipbuilding in the United States could show nothing to approach the record established in the year 1915. Approximately 120 merchant vessels of sea-going type with an aggregate tonnage of more than 500,000 tons were actually under construction.

* * *

An address delivered by J. J. Donovan, president of the Pacific Logging Congress ten years ago, a part of which was published in the Marine Review, is quite as true and quite as applicable today as it was ten years ago. Mr. Donovan said: "Let no grandiloquent boasting of dreamer or demagogue deceive you. Our flag is gone from the Pacific. It will go from the Atlantic as soon as the great war ends unless we radically change our laws along lines which will enable us to compete with the fleets of maritime nations. We may build up a lake and coastwise marine, no matter how onerous the legal handicap, by the simple expedient of shutting out foreign nations. That we have done, but on the world's highway we have trimmed our sails to every political breeze and our ships are waterlogged."

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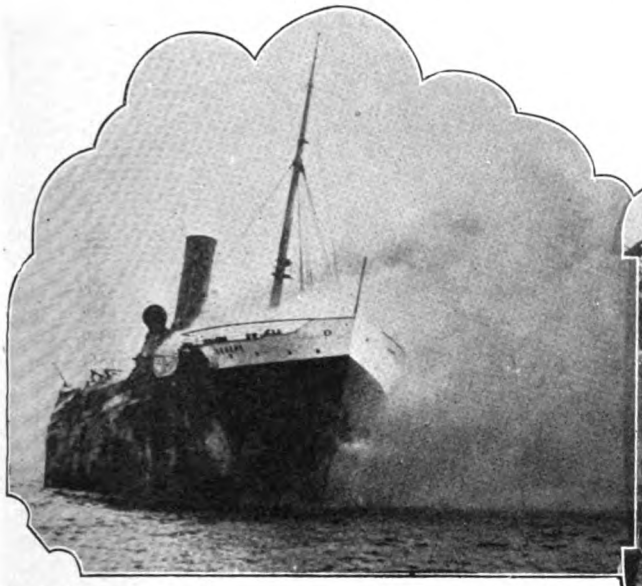
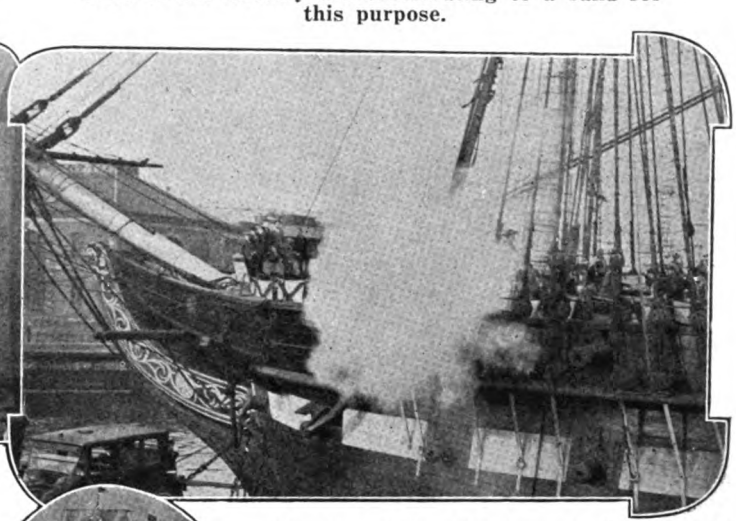
Photographs from Far and Near



S. S. Lenape on fire at sea, floating with the tide on the morning of Nov. 18 in Delaware bay where she had been towed by the coast guard cutter Kickapoo. The 252 passengers and crew of 115 were saved. The fire was discovered off Atlantic City on Nov. 17 shortly after leaving New York for Jacksonville, Fla.

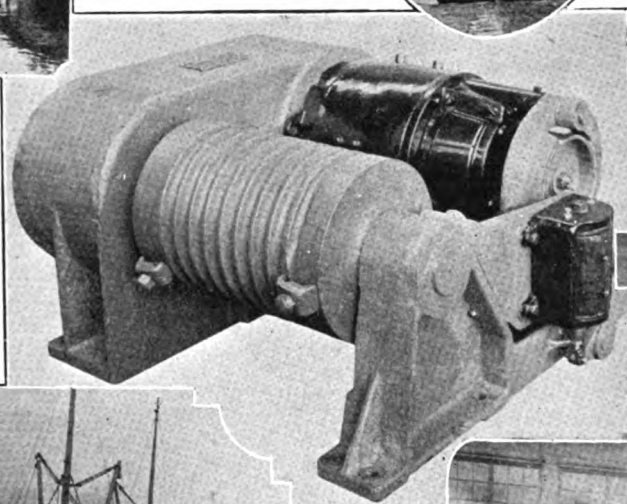
"Old Iron Sides." The famous U. S. frigate Constitution again fires a broadside after a generation of silence. Now being refitted at the Boston navy yard as a permanent memorial. The school children of the country are contributing to a fund for this purpose.

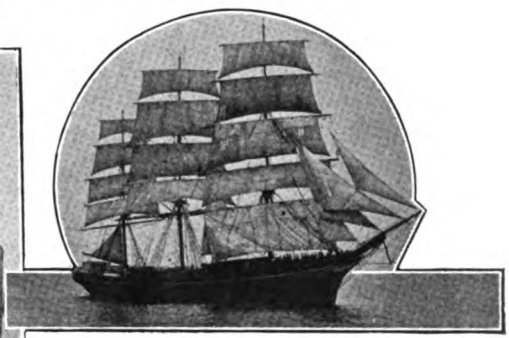


To the left, the beautifully modeled yacht Aloha, owned by Commodore Arthur Curtiss James, New York Yacht club, being converted to diesel-electric drive with Winton engines and Westinghouse electrical equipment at the Staten Island Shipbuilding Co.

Logs hauled to sawmills on barges, Kalamazoo river.

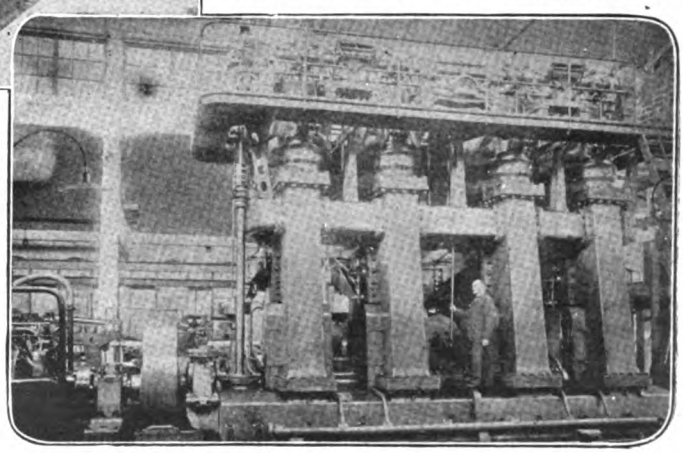
S. S. Bennington of the Rutland-Lake Michigan Co. loading freight at the municipal pier, Chi., for Florida.





Benjamin F. Packard, famous American clipper ship, built in Bath, Maine, 1883, with a record of 52 trips around Cape Horn has been bought by Theodore Roosevelt Pell, New York yachtsman.

Above—Electric drum type of steerer by American Engineering Co. Cut steel gears between motor and drum run in oil.



Swedish Nobel diesel engine developing 1600 horsepower at 105 revolutions per minute. Length, including the flywheel is 25 feet; width, 12 feet; height from center of shaft to top of fuel valve, 19 feet. Weight 160 tons.

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Late Decisions in Maritime Law

Legal Tips for Shipowners and Officers

Specially Compiled for Marine Review
By Harry Bowne Skillman
Attorney at Law

THE owner of a moored vessel, which was cast adrift by an employee without his authority, was held, in the case of No. C-4, 300 *Federal Reporter* 757, not to be liable for a resulting collision.

* * *

THE fact that the owner of a scow was engaged in dredging work for the government, as a private contractor, does not change the rule making it evidence of negligence to tie up his boat at the end of a pier when not at work, so as to unduly obstruct entrance to a slip.—F. J. No. 28, 300 *Federal Reporter* 805.

* * *

ARTICLE 16 of international rules, requiring moderate speed in a fog and careful regard to existing circumstances and conditions, govern the navigation of war vessels in time of war. "Moderate speed," required in a fog, it was decided in New York & Cuba Mail Steamship Co. v. United States, 300 *Federal Reporter* 827, means speed so slow that the vessel can be stopped within the distance at which another vessel can be seen, having regard to the fog density.

* * *

THE circumstances entitled to most consideration in all cases relating to salvage are: The value of the property saved, the extent of the service rendered, the degree of merit and gallantry displayed, and the danger to which the vessel was exposed and from which it was saved. "A general rule is," it was said in the case of Atlantic Refining Co., v. Merritt & Chapman Derrick & Wrecking Co., 300 *Federal Reporter* 901, "that a liberal award commensurate with the service rendered in the emergency should be allowed, such an award as will encourage and stimulate similar service by others."

* * *

ALL furnishers of repairs or supplies are required always to make inquiry, whether or not they know facts which would lead them to think that the vessel was not owned by the company operating it. The furnisher need go no further in his investigation if he finds out that the person ordering the repairs or supplies is the owner or his agent, unless he has reasonable grounds to suppose that the owner was in possession under an agreement for purchase which forbade the imposition of liens. In the latter case he must use reasonable diligence to discover the terms of the agreement for purchase. — United States v. Certain Subfreights Due Steamship NEPONSET, 300 *Federal Reporter* 981.

IN THE absence of law, contract or usage to the contrary, or partnership agreement between connecting carriers or joint contract for transportation, the liability of the initial carrier, although the goods are marked for a point beyond its line, terminates when it transports the goods to the end of its line and delivers to a connecting carrier, to be transported to destination; and, according to the case of Vital v. Kerr, 297 *Federal Reporter* 959, Act of June 29, 1906, amending interstate commerce act of Feb. 4, 1887, does not affect the liability as between connecting carriers, where the shipment was from outside the United States to a foreign country, and simply involved a transshipment at New York, without any carriage of the goods from one state through another state of the United States.

* * *

A STAUNCH and seaworthy vessel should carry the full cargo which her measurements and tonnage entitle her to carry, and a charterer of a vessel has a right to expect her to carry such a load. If she is unable to carry that amount of cargo because of any weakness, she must be deemed unseaworthy. Unseaworthiness is a comparative term. A vessel may be perfectly seaworthy for cargo-carrying purposes around the harbor, and not be seaworthy for oceanic carriage; and she may be seaworthy for the carriage of a load of lumber, and not be seaworthy for a load of steel rails. The law implies a warranty by the owner *** of seaworthiness for the purposes for which the SAGAMORE was chartered. The warrantor of the ability of the vessel to carry her full capacity of the freight contemplated by the parties is responsible for its failure so to do. *** A vessel being unseaworthy, liability cannot be escaped without the clear showing that the disaster was bound to have happened despite the unseaworthiness, and this burden rests on the owner. Therefore the charterer, as bailee, did not breach the contract to return the ship in good order and condition.—SAGAMORE, 300 *Federal Reporter* 701.

* * *

A VESSEL, overtaking another in a narrow channel, had to respect the rights and position of the other, it was held in the case of ENERGETIC, 297 *Federal Reporter* 670, unless the other either violated some rule of navigation herself, and thereby caused the collision, or in some way led the overtaking vessel into a trap.

WHERE a tug was employed as mere motive power of a tow, and both vessels were exclusively under control of a pilot not compulsorily employed by the master, fault will not be imputed to the tug for collision with a draw and abutments of a bridge, provided the tug was properly equipped and seaworthy, it was decided in the case of the United States v. Port of Portland, 300 *Federal Reporter* 724. "It would likewise be the duty of the master," said the court, "to advise the pilot of any facts which would assist him in the movement of the ship. The master, however, could not navigate the ship, for the very purpose of taking the pilot was to put the ship under the control of one specially informed concerning the tides, currents, channels, and other conditions of the harbor."

* * *

WHEN operators had full knowledge of the restraints imposed by a foreign government and the space available, and the shipper has no such knowledge, and goods were transported to be shipped to the point of embarkment at a great expense, the defense of restraint of princes is unconscionable and cannot be sustained in an action for damages for breach of contract. The restraint of princes clause, it was declared in the case of Rotterdamsche Lloyd v. Gosho Co., 298 *Federal Reporter* 443, relates to future restraints, not to restraints already existing. The undertaking of the carrier is that he will transport the freight, unless restrained by some future act of government, not that he will transport if present restraints are removed.

* * *

WHERE a steamship's equipment offered by contractor did not conform to the contract, the ship was not bound to accept same, nor to await repair thereof, where to do so would delay the vessel, with consequent damage.—NEW ROCHELLE, 298 *Federal Reporter* 525.

* * *

WHERE bills of lading authorized a vessel to deviate from the direct route between the ports of shipment and destination, and provided that the carrier should not be liable for any loss or damage caused by prolongation of the vessel, it is not liable for damage to a cargo of grain caused by failure to deliver it within what would have been a reasonable time for a direct voyage.—Florida Grain & Elevator Co., v. United States Shipping Board Emergency Fleet Corp., 300 *Federal Reporter* 169.

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Dickerson N. Hoover Heads Steamboat Inspection

Shortly after the resignation of General Uhler, President Coolidge nominated Dickerson N. Hoover, the deputy supervising inspector general for the office of supervising inspector general of the steamboat inspection

DICKERSON N. HOOVER

service. His nomination was confirmed by the senate.

Dickerson N. Hoover was born on Sept. 9, 1880, and received his education in the public schools of the District of Columbia. He holds a degree of bachelor of law from George Washington University, and is a member of the bar of the supreme court and the court of appeals of the District of Columbia.

He entered the steamboat inspection service on April 13, 1903, and was first assigned to duty at Marquette, Mich., and was later promoted and transferred to Chicago. From Chicago he was transferred and promoted to the office of the supervising inspector general in Washington. In this office he has performed all of the duties of all of the positions at some time or other. He came up from the grades to a position as chief clerk, then to deputy supervising inspector general, and has finally been appointed as supervising inspector general.

Such a steady consistent rise speaks well for the character and ability of the new inspector general. And it is a pleasure to note that ability and faithfulness in service has been recognized.

Dinner to General Uhler

A dinner was tendered General George Uhler, until recently supervising inspector general of the United States steamboat inspection service. The dinner was held at the Waldorf-Astoria, N. Y., Jan. 14, under the auspices of the American Steamship Owners' association and Alfred Gilbert Smith, president, presided. General Uhler was lauded for his intelligent and conscientious conduct of the steamboat inspection service for so long a time.

Becomes Vice President of Westinghouse Co.

At a recent meeting of the executive committee of the Westinghouse Electric and Mfg. Co., S. L. Nicholson was elected acting vice president. He is a native of Philadelphia, began his electrical career in 1887 being associated with various companies from that date until 1898 when he joined the Westinghouse company.

In 1909 Mr. Nicholson was made sales manager of the Westinghouse company and held that position until 1917 when he was made assistant to the vice president.

He assisted in the formation of and was the first president of the American Association of electric motor manufacturers, which is now known as the Electric Power club. He was chairman of the electric manufacturers' council, which is the co-ordinating committee of the Power club, Electric Manufacturers' club and the

S. L. NICHOLSON

Association of American Manufacturers of electrical supplies. In 1921, he was chairman of the tariff committee of the council and represented the electrical industry on the national industry conference board.

A Californian Appointed U. S. S. B. Commissioner

Philip S. Teller, Republican, of San Francisco, has been confirmed by the senate as a member of the shipping board to fill the vacancy left by the resignation of Meyer Lissner, also of California. Commissioner Lissner re-

PHILIP S. TELLER

signed recently because of ill health.

Commissioner Teller has had considerable interest in shipping affairs, having been formerly chairman of the San Francisco Harbor commission. More recently he has been in other business in San Francisco. He also has served as Republican state chairman in California. Considerable competition had developed on the Pacific coast for the place left vacant by Commissioner Lissner, as well as that left vacant by the withdrawal of the name of Commissioner Bert E. Haney, of Oregon, by President Coolidge.

Reports have prevailed that a Republican also would be appointed from the North Pacific coast if one of the present members of the board resigns. This would give the President the opportunity to name a Democrat from the East, and thus maintain the bipartisan line-up on the board as required by law.

Mr. Teller was a member of the delegation representing West Coast commercial organizations that visited South America in 1923 in the interest of promoting trade relations between the Pacific coast and South American countries. He was recommended to President Coolidge by Senator Shortridge, of California. His experiences as harbor commissioner and interest in marine affairs should strengthen the board.

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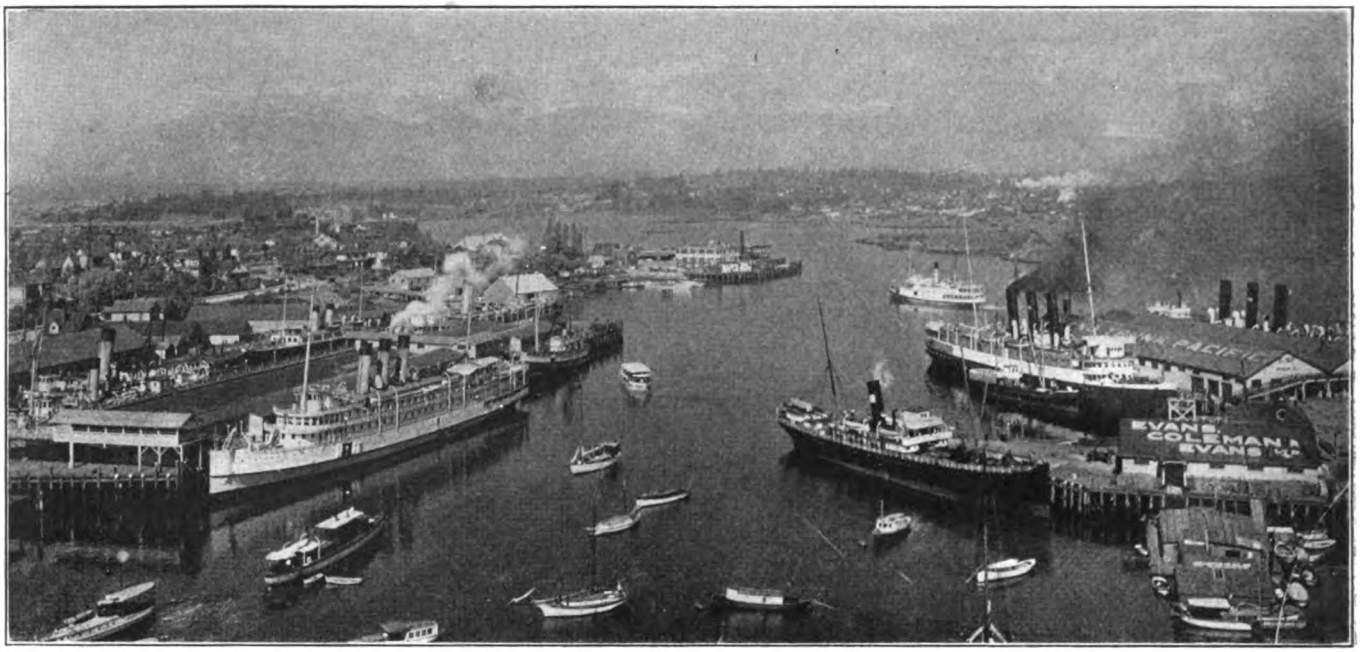

One of the three harbors of the Port of Victoria, B. C.—Known as the Inner Harbor

Victoria Is Canada's Pacific Gateway

The First and Last Port of Call for the Pacific Northwest

BY FRANK GIOIMA

PROBABLY even the youngest son of a sailor or any man who takes an interest in marine matters knows that Victoria, the capital city of British Columbia, is on the southern end of Vancouver Island and is the first and last Pacific port of call not only for Canada but also for all the Pacific Northwest. Situated as she is on the Straits of Juan de Fuca all vessels in or outward bound to or from Seattle and Vancouver pass her front door. And one should remember that during recent years great changes have taken place in the movements of shipping on the Pacific Coast. In the past, San Francisco was the principal port but today a great and growing volume of shipping passes through the Straits of Juan de Fuca en route to Seattle and other Washington ports and Vancouver City and British Columbia generally.

Perhaps because she has been more interested in the past years in other commercial and industrial pursuits than in purely maritime matters, Victoria does not rank quite so highly as a port as her natural position and advantages should place her. Still the number of vessels arriving and clearing, both ocean and coastal, in 1924 was 10,674, with a tonnage of 10,099,978. While these figures place Victoria as the second largest port in Canada, the number of vessels is small when one considers the harbor facilities available. And in talking of Victoria as a port one should really use the plural, for Victoria has no less than three excellent harbors. The outer harbor comprising Rithet's wharves with an area of 16 acres and the Canadian National docks at Ogden Point, covering some 30 acres; the inner harbor; and the famous Esquimalt harbor, 940 acres in extent. The outer harbor and Esquimalt harbor are used chiefly by ocean going ships, while the inner harbor is used by coastwise vessels. Besides these harbors safe sheltered anchorage can be found in the Royal roads off the entrance to Esquimalt harbor.

The outer docks are able to berth any ship afloat and all vessels can enter and leave under their own steam. When the ships of the special British Empire squadron visited Victoria, both the HOOD and REPULSE not only entered the Ogden Point docks under their own steam but tied up alongside each other in the same basin.

The Ogden Point docks have two piers protected by a solid granite block breakwater 2750 feet in length. One side of the pier nearest the breakwater is 1000 feet in length. The other side, and the sides of the adjoining piers are each 800 feet. The width of each pier is 250 feet, separated by a minimum depth of 38 feet at low tide. These piers have a warehouse space of 180,000 square feet, fresh water hose connections every twenty feet, good passenger accommodations and conveniences. All berths on pier A are fitted with floating fender logs and the corners of both piers have spring buffers. As both piers are constructed of solid stone and cement they will carry any weight. There is ample berthage for eight ocean going vessels. Besides other merchandise, over 12,000,000 feet of lumber was shipped from the Ogden Point docks during the twelve months ending April 30, 1925, and the Canadian National railroads, manager of this property for the Canadian government, now has under advisement the organization there of a lumber assembly plant for the whole island, the lumber resources of which are over 120 billion feet, and the erection of grain elevators, these latter to facilitate the shipping of Canadian wheat via the Pacific Coast and Panama to Europe.

Rithet's wharf, being the other section of Victoria's outer harbor, comprises three wharves in from 27 to 33 feet of water. The first of these known as No. 1 wharf has a length of 688 feet by 100 feet wide and a shed of 541 feet by 60 feet, with a

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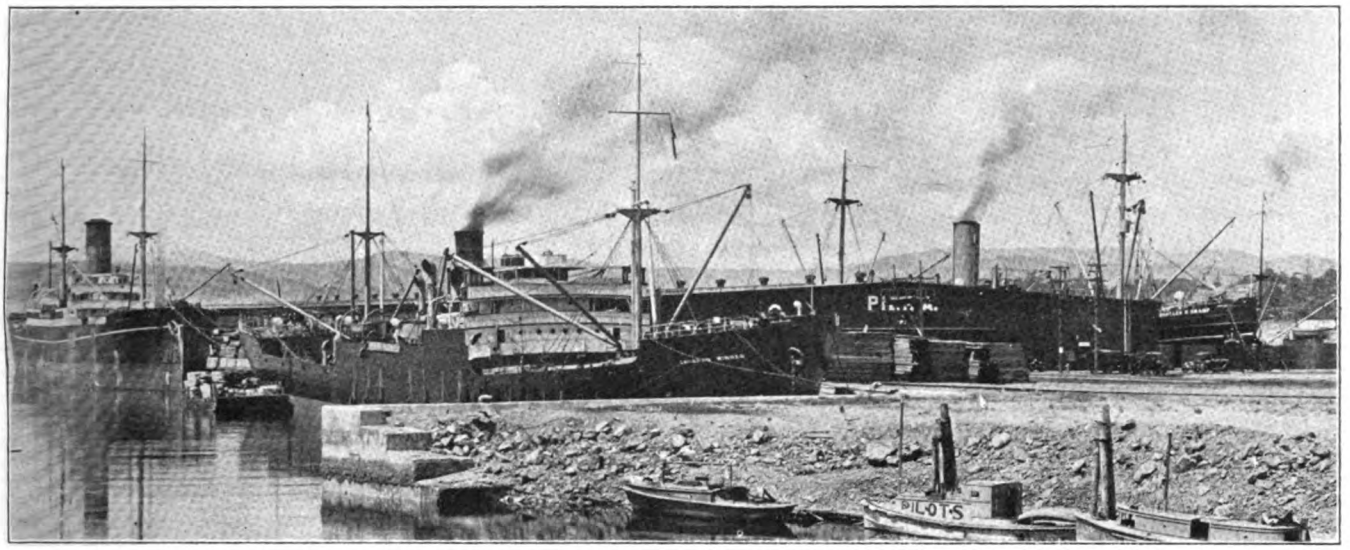
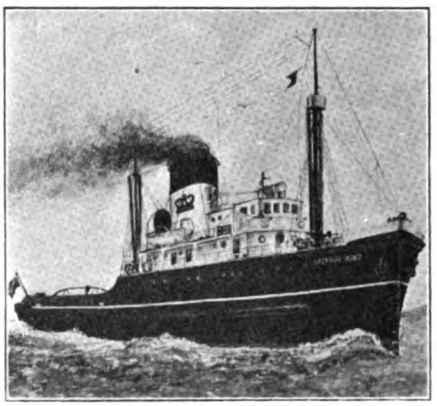


OGDEN POINT OCEAN DOCKS LOCATED IN THE OUTER HARBOR, VICTORIA, B. C.

carrying capacity of 1600 tons. At the ends of the sheds are open spaces for rough freight of 58,000 feet and 10,500 feet. Five slips give ample facilities for handling cargo through the ship's ports. The second known as No. 2 wharf is 1050 feet in length by 125 feet in width, with a shed 818 feet in length, varying in width from 59 feet to 90 feet, and with a floor area of 68,090, and a carrying capacity of 13,000 tons. There is an open space at the ends of the shed of 21,500, and 18,000 for rough freight. The depth of water is 31 feet and the space between wharves is 190 feet. There is also berthage of 300 feet frontage, where small vessels can be made fast in 25 feet of water; and two sheds respectively of 20,100, storing about 4000 tons and an additional 8000 feet carrying about 1800 tons.

The inner harbor is used chiefly by coastwise vessels but as many of the great lumber and shingle mills are built on its waterfront, many sailing ships and steamers engaged in this business enter it. Also on its northwest shores are 80 acres of industrial sites with railroad and trackage facilities and a water frontage of 3500 feet with a depth of 20 feet. These sites are owned by the Provincial government and such as are not at present being utilized can be leased at very reasonable rates.

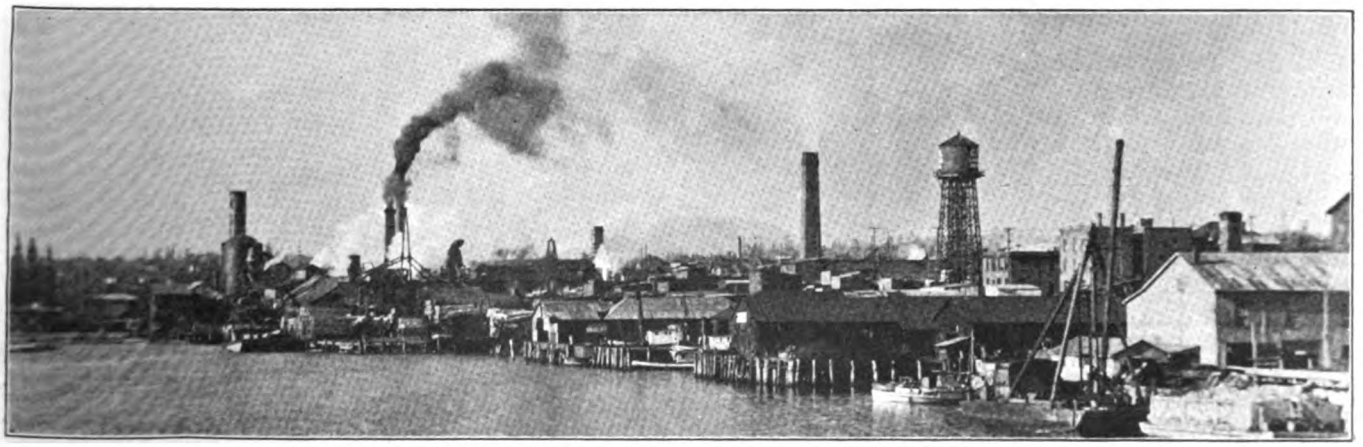


SALVAGE KING—A NEW AND EXCEPTIONALLY WELL EQUIPPED POWERFUL SALVAGE STEAMER

Esquimalt harbor is naturally landlocked, has an excellent and easy entrance an area of 940 acres and a depth of from 6 to 8 fathoms. It was originally used as the Pacific station of the British fleet and is today the headquarters on the Pacific of the Canadian navy. Besides Yarrows shipbuilding and repair plant there are two drydocks at Esquimalt. The length of the older dock to the gate is 450 feet at keel blocks, 480 feet at curb, with a width at gates of 65 feet, and a depth of water of 27 to 29 feet.

The new drydock which was completed last fall is the second largest on the American continent and is only 29 feet shorter than the Commonwealth drydock at Boston. This giant basin, hewn out of the living rock, cost approximately $6,000,000 and measures 1150 feet long, 149 feet in width at the top and 126 feet at the bottom. Its depth is 49 feet 6 inches, with 40 feet of water over the sills at high water. The dock will take any ship afloat, or, if desired, can be divided into two sections of 400 feet and 750 feet respectively. It is lined with concrete, with granite keel and bilge block seats, and is equipped with four caisson berths of granite.

(*Continued on Page* 46)



A VIEW OF THE MARINE FRONT OF THE INNER HARBOR, VICTORIA, B. C.

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What the British Are Doing

Short Surveys of Important Activities in Maritime Centers of Island Empire

SIR W. H. RAEBURN, chairman of the Clyde Trust, reviewing the work of the Glasgow harbor for last year said it was the worst year commerce had yet had, and the worst for shipping in his 50 years experience. December, however, showed some improvement, and as ship owners they were beginning the new year with rather better hopes.

* * *

FROM the shipbuilding point of view there is a general expectation that this year will show an improvement on last. During 1925, 19 British firms had an output of over 20,000 gross tons. Of these 13 had increases and 6 decreases. Harland and Wolff with 113,300 gross tons heads the list for the fourth year in succession, Swan Hunter & Wigham Richardson take second place with a total of 82,640 gross tons, the battleships NELSON and RODNEY are chiefly responsible for the increased output of Armstrong Whitworth and Co. and Cammell Laird & Co., their respective totals being 64,424 gross and 54,938 gross tons. The fifth on the list, William Gray & Co. with 54,525 gross tons shows a decrease; but Alexander Stephen & Sons have an output approaching six times that of the previous year with 52,823 tons.

* * *

SIR GEORGE HUNTER, speaking at the launch of the motor ship ATHOLKING, 14,000 tons, at Wallsend-on-Tyne described 1925 as the worst in a long continued depression of shipbuilding. More than half the shipyard workers were idle. Four of his firm's nine yards were closed, and others only partially employed. For the first and only time since 1872 he had not a single ship on the stocks in his two large Wallsend yards. The chief causes of depression and unemployment were high costs and low production, and especially the high cost of coal. He considered the reason to be that they were not working hard enough. Old England was not done yet, but unless everybody worked hard he could not say what would happen.

* * *

A & J. INGLIS have launched the twin screw motor vessel ROMA, of about 1450 tons gross, which they have built for the cargo trade in the Argentine of the Argentine Navigation Co. (Nicholas Mihanovich) London. The vessel is equipped with eight electric winches and steel derricks for handling cargo at four large hatchways. The windlass, steering gear, and warping capstan aft are all driven electrically. The propelling machinery will consist of two sets of single-acting Diesel engines having six cylinders. The machinery is being supplied by Messrs Harland and Wolff's Diesel engine works, Glasgow. The ROMA is a duplicate of the MADRID.

What's Doing Around The Lakes

MORE than 500,000 persons were carried in 1925 on the 12 steamers of the Goodrich Transit Co., Chicago, according to H. W. Thorp, president. Both vacation trips and one-day excursions showed big gains. Demand for fast over-night package-freight service has accompanied the development of Wisconsin and western Michigan into a popular resort country. Cross-lake automobile transportation, as low as $5 per car, has grown in favor as autoists seek to avoid the crowded highways in the Chicago district.

* * *

SAYS Mr. Thorp: "Boat line officials look forward to the 1926 season with confidence that it will be by far the greatest in the history of lake navigation." This is echoed by B. J. Kennedy, general passenger agent, Michigan Transit Co., Chicago: "Most of the lake steamers are now in winter quarters where they are being repaired and remodeled for the 1926 season of navigation, which promises to be the greatest ever known on the Great Lakes."

* * *

AN ENFORCED stay of 27 days on Green island without mail or communication with the mainland came to an end, Dec. 27, for Frank Drew, lightkeeper, and Alfred Cornell, his assistant, when they arrived at Marinette, Wis.

* * *

MAJ. RUFUS PUTNAM, federal engineer at Chicago, is recommending the construction of fixed bridges across the Chicago river and the abandonment of the river as a navigable stream, in a report to the war department at Washington.

* * *

TWICE in the early part of January the ILLINOIS of the Goodrich Transit Co. was locked in the ice at the entrance to the Benton Harbor-St. Joseph harbor. Once she was held fast six days.

* * *

THE UNITED STATES, of the Peninsula & Northern Navigation Co., Milwaukee, which was taken to southern waters in November, is now in service between Miami and Tampa, Fla., leaving Miami every Tuesday and Saturday.

* * *

PERMISSION for the Nickel Plate railroad to proceed with the dredging of the Calumet harbor, in the South Chicago district, has been denied by William F. Mulvihill, superintendent of the Illinois department of purchases and construction. The chief objection is that the railroad is obligated to spend $600,000 only, and that the city would be called upon to pay the excess cost of dredging. The cost of dredging has been estimated at 25 cents a cubic yard and the state places the cost nearer 45 cents. Chicago officials defend the 25 cent estimate.

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Congress is Not Much Concerned About the Merchant Marine

BY FRED B. PLETCHER
Washington Representative, Marine Review

PRESSING merchant marine problems have remained at a standstill in congress. With the questions at issue concerning the proper administration and functioning of the government shipping bureaucracies sorely complicated, wide differences of opinion as to the course of action are manifest.

It is indicated clearly that one of the leading questions regarding probable action in the merchant marine mess in this session of congress will revolve around authority and control of the shipping board. Those who would make the shipping board independent of the authority of the President are numerous in both houses of congress.

Divorce Corporation From Board

Divorce of the Fleet corporation from the shipping board and the creation of a federal shipping council and regional advisory councils with authority to develop trade routes proposed in a bill introduced Jan. 21, in congress by Representative Bacon of New York follows recommendations of the National Merchant Marine conference and coincides largely with the views of President Coolidge and it also supplements a bill recently introduced by Representative Scott of Michigan. The Bacon bill would turn over to the President all the stock in the Fleet corporation, would terminate the shipping board and provides for the appointment of a merchant marine commission, three members which would assume the regulatory duties of the board.

President Coolidge's recent policies of attempting to direct shipping board and Fleet corporation activities have been attacked several times in the senate within the last few weeks.

Senator Edge, of New Jersey, defending the President's attitude differentiated between the shipping board and the other commissions. The shipping board, he pointed out, has the dual responsibilities of operation and regulation, while the other commissions are semi-judicial in their nature and should be more or less unhampered.

"Personally, if there is sufficient public business—and perhaps there is—for the shipping board to be continued as an independent agency of the government," Senator Edge declared, "for the regulation of rates and proper responsibilities, I shall be entirely satisfied to see such a board continued. In that event and for those responsibilities the board should be a judicial board and independent of the President.

"From the standpoint of operation of a going business, however, I am convinced that the going business of the government or of a private corporation or individual is of such character that it cannot be administered satisfactorily or successfully by a board. I believe that such a responsibility in the case of the shipping board is the same, only in a greater degree, as the going business of any other department of the government, where through a cabinet officer or the head of a department, the President's policy is naturally reflected.

Wants a Business Administration

"The operation of shipping is a great big government business and in my experience and contact with business I have never seen a business which has been successfully administered unless there was actual executive control.

"Go ahead, have a shipping board, representative of the various sections of the country, if you wish, if we can satisfy ourselves that there is sufficient business of a regulatory character to warrant the board—and as I have already said I am inclined to think there is—but let us organize this great business of operating shipping lines on the Pacific and the Atlantic and the Gulf on business principles; let us permit the President, elected by the people, to carry out a general policy."

The shipping board has taken back the American Palmetto line, which was sold to the Carolina Co. of Charleston, S. C., in September, because the company has sustained such losses in the operation of the line that it could not continue, according to the board. Chairman O'Connor said the company was the victim of unfair practices on the part of foreign lines in the same trade. The action of the board was in line with its declaration recently that if purchasers of shipping board lines were not successful in the operation of the lines, the board would operate them again. According to the shipping board officials, the Carolina Co. will forfeit an initial payment of $75,000 on the line, and sustain the losses incurred since last September. It is understood that the company has lost on an average of $10,000 a voyage.

Crowley's Appointments Approved

The shipping board has approved the action taken by President Crowley, of the Fleet corporation, in filling vacancies created by recent resignations. G. K. Nichols, who has been special assistant to the president, has been named a vice president, and J. Harry Philbin, manager of the ship sales division, also has been promoted to a vice presidency. James A. Wilson, for a time connected with the Munson Steamship line, has been appointed director of operations, succeeding Asa F. Davison. Warren F. Purdy becomes European director.

Two Practical Steps

Why doesn't the Postmaster General award mail contracts according to the present law to American steamship lines engaged in the foreign trade? Such a step would be very definite aid and encouragement, not only financially but in the way of standing and prestige in foreign ports.

The construction loan fund might be used to encourage American steamship owners in the building of large fast diesel freighters of latest design. Up to 80 per cent of the cost of construction (to apply only to the building of approved diesel vessels) might be loaned on the basis of 2 per cent and return of the loan over a period of 20 years. On such terms the differential in first cost in the United States and in Europe would be met, Americans could complete with economical ships and the shipyards would be given much needed work.

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Plan Huge Port Project for Boston

Representative business men of Boston recently appeared before the board of engineers for rivers and harbors at Washington to describe a proposed water front development which they said would immediately follow the deepening of Dorchester bay channel. The project it is said would be greater than the Bush terminal development of New York City, and would unify railroads and steamship terminals. The Boston delegation said that $100,000,000 was available for developing the Dorchester bay property if the deepening of the harbor were undertaken by the government.

Steel Barges Ordered

The Inland Waterways Corp., Washington, D. C. recently awarded a contract to the Dravo Contracting Co., Pittsburgh, for the construction of 10 steel barges. These barges will have a cargo capacity of about 2000 tons and will be constructed for Mississippi river service. The cost is in the neighborhood of $50,000 each. It seems that the Inland Waterways Corp. is rapidly developing business.

So. American Service To Moore & McCormack

The International Freighting Corp. will be relieved of the operation of the American Republics line on or before February 1926, and the Moore and McCormack Co. Inc., will take over this service. This line operates from North Atlantic and South Atlantic ports to ports on the East Coast of South America.

On Dec. 27 the schooner EDWARD J. LAWRENCE, said to be the last six-master on the seas was destroyed by fire while anchored in Portland, Me.

Ocean Freight Rates

Per 100 Pounds Unless Otherwise Stated

Quotations Corrected to Jan. 23, 1926 on Future Loadings

NOTE: FREIGHT RATES STEADY WITH BUSINESS FAIR

New York to	Grain	Provisions	Cotton (H. D.)	Flour	General cargo cu. ft.	General cargo 100 lbs.	††Finished steel	REMARKS Freight Offered
Liverpool	3s 3d	$0.50	$0.30	0.20	$0.40	$0.75	$7.00T	Fair
London	3s 6d‡	0.50	....	0.20	0.40	0.75	7.00T	Fair
Oslo	$0.20	0.45	0.50	0.27	0.42½	0.85	7.00T	Good
Copenhagen	0.20	0.45	0.40	0.26	0.42½	0.85	7.00T	Good
Hamburg	0.12	0.35	0.35	0.20	0.37½	0.75	8.00T	Good
Bremen	0.14 to 0.18	0.35	0.40	0.20	0.37½	0.75	8.00T	Good
Rotterdam and Amsterdam	0.13	0.32½	0.45	0.22	0.35	0.70	7.50T	Fair
Antwerp	0.12	0.32½	0.35	0.21	0.35	0.70	7.50T	Good
Havre	0.14	0.50	0.35	0.27½	0.40	0.75	8.00T	Fair
Bordeaux	0.14	0.50	0.35	0.27½	0.40	0.75	8.00T	Dull
Barcelona	....	12.00T	0.30	10.00	—12.00T—		8.00 to 15.00T	Fair
Lisbon	....	0.65	0.40	7.00T	—20.00T—		7.00T	Fair
Marseilles	0.15	0.55	0.30	6.00	—20.00T—		5.00T	Slow
Genoa	0.14	12.50	0.40	7.00	—20.00T—		10.00T	Fair
Naples	0.14	12.50	0.40	7.00	—20.00T—		10.00T	Fair
Constantinople	0.27	17.00T	....	0.35	—20.00T—		9.00T	Fair
Alexandria	....	17.00T	0.90	0.35	—20.00T—		9.00T	Fair
Algiers	....	0.75	0.50	0.40	—20.00T—		7.00T	Fair
Dakar	....	15.00	....	14.00T	—21.00T—		10.50T	Good
Capetown	9.00T	18.00	....	12.00T	—18.00T—		18.00T	Good
Buenos Aires	....	20.00T	....	....	—20.00T†		8.80T	Good
**Rio de Janeiro	....	20.00 to 22.00T	....	8.80 to 8.00T	20.00 to 22.00T†		7.00 to 7.70T†	Good
Pernambuco	....	22.00T	....	9.00T	—22.00T—†		9.70T†	Good
Havana	0.22½ to 0.27½*	0.42½*	....	0.22½*	0.61*	1.33*	10.20*	Very good
Vera Cruz	0.25	0.40	0.45	0.25	0.52½	1.05	0.30 to 0.35	Very good
Valparaiso	....	1.07	....	0.70	0.45	0.80	10.00T	Fair
San Francisco	....	0.40 to 0.70	....	0.50 to 1.10	....	....	0.30 to 1.00	Fair
Sydney	....	18.00T	2.50	1.25	18.00-24.00T		9.00-12.00T	Good
Calcutta	....	14.00T	0.70	16.00T	—16.00T—		10.00T	Good

T—Ton. ‡Per quarter of 480 lbs. †Landed. ††Heavy products limited in length. *Extra charge for wharfage. **Plus $1.00 surcharge on all rates to Rio de Janeiro on account of congestion.

From North Pacific Ports to	Lumber Per m. f.
San Francisco	$5.00
South California	5.00 to 6.00
Hawaiian Islands	10.00 to 12.00
New Zealand	16.00 to 18.00
Sydney	13.00 to 14.00
Melbourne-Adelaide	13.00 to 14.50
Oriental Ports	11.50 to 13.00
Oriental Ports (logs)	15.00 to 16 00
Peru-Chile	12.50 to 14.50
South Africa	17.00 to 18.00
Cuba	15.00 to 17.00
United Kingdom	75s to 90s
United Kingdom (ties)	70s to 80s
Baltimore-Boston range	$15.00 to 16.00
Florida Range	18.00 to 21.00
Buenos Aires	14.00
Flour and Wheat	
U. K. and Continent (gross ton)	35s to 37s 6d
Oriental Ports (net tons)	$4.50 to 5.00

Principal Rates To and From United Kingdom

	s	d		s	
Grain, River Plate to United Kingdom	18	0	Pig iron, United Kingdom to New York or Philadelphia	9	0
Coal, South Wales to Near East	11	0	Iron ore, Bilbao to Cardiff	6	6
Coal, United Kingdom to Buenos Aires	14	3	Iron ore, Huelva to Phila. or Balto	11	3
Manganese Ore, Poti to Philadelphia	$4.00				

NOTE: Lighterage rates on fuel in New York reduced from 6½ to 5½c per barrel.

Bunker Prices

At New York

	Coal alongside per ton	Fuel oil alongside per barrel	Diesel engine oil alongside per gallon
May 18, 1925	5.00@6.00	1.75	5.48c
June 4	5.00@6.00	1.86½	5.50
July 20	4.90@6.00	1.75	5.50
Aug. 17	5.00@6.00	1.71½	5.50
Sept. 19	5.50@6.00	1.71½	5.00
Oct. 17	5.00@6.00	1.70½	5.00
Nov. 18	5.50@5.60	1.70½	5.00
Dec. 18	5.60	1.70½	5.00
Jan. 20, 1926	5.50@6.25	1.75@1.80	5.25

At Philadelphia

	Coal trim. in bunk per ton	Fuel oil alongside per barrel	Diesel oil alongside per gallon
May 18, 1925	5.00@5.80	1.85@1.91½	5.41@5.64c
June 4	4.90@5.50	1.86½	5.50
July 20	4.90@5.50	1.69@1.81½	5.15@5.43
Aug. 17	5.00@5.80	1.56@1.71½	5.15@5.29
Sept. 19	5.25@5.50	1.55@1.61½	5.00
Oct. 17	5.25@5.50	1.71½@1.74½	5.15@5.65
Nov. 18	5.40@5.65	1.71½@1.74½	5.15@5.25
Dec. 18	5.15@5.50	1.71@1.74½	4.80@5.15
Jan. 20, 1926	5.50@6.25	1.71@1.79	5.00@5.65

Other Ports

Boston, coal, per ton...$7.03
Boston, oil, f. a. s., per barrel...$1.71
Hampton Roads, coal, per ton, f.o.b., piers..4.75 to 5.10 f.o.b.
Oct. 12 — Cardiff, coal, per ton...12s 3d
London, coal, per ton..25s 0d
Antwerp, coal, per ton..21s 0d
Antwerp, Fuel oil, per ton..77s 6d
Antwerp, Diesel oil, per ton...97s 6d
British ports, Fuel oil...72s 6d
British ports, Diesel oil..87s 6d

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Niven Directs Sales General Electric

Following the retirement of Maxwell Day, the marine engineering department of the General Electric Co. has been consolidated with the commercial department under the direction of D. W. Niven. Because the marine sales department has been responsible for all company negotiations with the various federal government departments, the name of the department has been changed, and will be known hereafter as the federal and marine department.

John W. Langley Retires

John W. Langley, Boston passenger manager of the International Mercantile Marine Co., retired to private life Dec. 31, 1925, terminating a service of 43 years in the steamship business.

In 1878 he started with the Fall River line in Boston. He joined the staff of the Dominion line on Jan. 1, 1900, and when that company was merged with others to form the International Mercantile Marine Co. in 1904, Mr. Langley continued with the larger organization, serving for many years as head of the steerage passenger department. In recent years he has been head of the entire passenger division in Boston. George W. Howard, his assistant for several years, will succeed him.

December Lake Levels

Lakes	Feet above mean sea level
Superior	600.87
Michigan-Huron	577.54
St. Clair	572.83
Erie	570.46
Ontario	244.55

Regular freight service between Boston and Miami, Fla., is planned by the Plant Line Steamship Co.,

W. O. Whitney Appointed Sales Manager

The Maxim Silencer Co., Hartford, Conn., manufacturer of silencers for industrial machinery and marine engines appointed W. O. Whitney as sales manager, effective Jan. 1, 1926.

Mr. Whitney was formerly with the Brunswick-Kroeschell Co., New Brunswick, N. J., manufacturers of refrigerating machinery. For the last ten of the 16 years with this firm, Mr. Whitney was manager of the marine department sales.

The greatest number of commercial ships to transit the Panama canal in one day occurred on Nov. 23, 1925 according to Gov. M. L. Walker. Sixteen eastbound and seven westbound ships passed through the canal on that day. The previous record was 15 ships on May 2, 1924.

Follow Rules for Boiler Welding

THE recent disaster to the steamship MACKINAC in Long Island Sound, with considerable loss of life, as a result of a boiler explosion has been the subject of considerable discussion as to the cause. That the explosion came as the result of failure of a welded patch on one of the boilers was the theory first advanced. This was later disproved; but the subject of welding was brought forcibly to the attention of engineers and the public generally.

To clarify many matters with which those responsible for welding work should be thoroughly cognizant. S. W. Miller, past president of the American Welding society has prepared a set of instructions on the subject of "Welding on Boilers." These instructions constitute a code of procedure that should aid in avoiding boiler accidents.

In view of the ever-widening applications of fusion welding throughout industry and the probability that repair to boilers made in this way will be proposed from time to time, it is well that those responsible for the results of such work should bear in mind several points. For simplicity, these are listed briefly below:

1. Most boilers are insured.
2. Many boiler insurance policies are so worded that, if repairs are made without the authority of the company carrying the insurance, the policy becomes void.
3. Federal, state and municipal regulations govern this work, as well as regulations issued by the insurance companies themselves.
4. Only competent welders, experienced in boiler work, should be allowed to do the welding.

Therefore, the following precautions should be observed by the owner or by his representative:

1. Examine that part of the boiler to be welded, in company with the insurance company inspector, and get his approval before doing any welding.
2. At the test after welding, be present with this inspector.
3. If possible, get the inspector to sign a statement that the work has been properly done and that it has passed the test successfully.
4. If the boiler is not insured, and comes under federal, state or municipal supervision, carry out the above program in company with the proper authority.

If the boiler is neither insured nor under supervision of some constituted authority, ample precautions should be taken by the welder and the owner to protect themselves against possible future trouble. They should make a sketch of the location and size of the repair, with a clear statement of what was found wrong and how the repair was made. They should always make a hydrostatic hammer test of the finished job using a pressure of one and one-half times the working boiler pressure, in the presence of witnesses, and should get the signatures of these witnesses to a statement of the facts. These papers should be carefully filed away. No welding should be done which is not permitted by law or by good practice.

In the case of marine work, the welding should pass the regular examination of the federal steamboat inspection service. In all instances, the welder should make friends with the insurance inspectors and with other inspectors by refusing to do work unless authorized by them, by being conservative in what work he recommends, and by never doing anything but a first-class job.

Steel River Hulls Under Construction

The American Bridge Co., Pittsburgh, is building the steel hull for a steamboat for the Carnegie Steel Co. It is expected that the hull will be completed and launched in February, when it will be taken to the marine ways of the company at Coal Valley, where the cabin will be erected, the boilers and machinery placed. This boat will be of the same size as the steamers A. O. ACKARD and WILLIAM G. CLYDE. The American Bridge Co. is also engaged in building 12 steel double-bottom barges for the Tennessee Coal, Iron & Railroad Co. These barges, which are each 140 feet long, 25 feet wide and 9 feet deep, are for service on the Warrior river. The American company recently completed the building of 12 steel barges for the Crucible Fuel Co., which were delivered in December. Delivery also was made in December of ten barges for the Ohio River Co.

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Marine Business Statistics Condensed

Record of Traffic at Principal American Ports for Past Year

New York

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1925 ..	431	1,706,900	510	2,022,775
November	473	1,902,745	488	1,886,587
October	450	1,920,797	530	2,229,801
September	449	1,960,366	505	2,117,563
August	469	1,889,239	498	1,933,228
July	457	1,813,338	547	2,180,581
June	521	2,177,995	507	2,103,914
May	435	1,820,544	538	2,215,561
April	434	1,796,849	528	2,093,444
March, 1925	472	1,899,036	517	2,032,263

Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)
(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1925....	83	194,283	53	142,885
November	83	216,604	44	116,468
October	74	193,534	49	128,906
September	85	211,019	51	113,257
August	84	197,743	65	146,144
July	96	241,244	57	131,400
June	107	260,756	67	165,940
May	87	209,866	63	155,359
April	102	243,546	67	182,335
March, 1925	96	238,863	58	163,257

Boston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1925....	96	270,869	67	210,652
November	115	341,258	59	147,554
October	105	312,455	73	206,347
September	114	328,275	78	196,632
August	136	349,514	104	246,275
July	140	336,982	115	283,558
June	161	368,009	111	213,985
May	118	296,551	93	205,291
April	99	224,275	82	179,010
March, 1925	94	295,292	54	159,928

Portland, Me.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1925....	31	85,651	29	75,072
November	25	35,616	23	33,194
October	17	27,630	20	34,668
September	19	36,082	22	45,258
August	16	37,391	17	36,191
July	23	48,916	23	54,903
June	26	37,668	23	38,892
May	23	42,242	27	47,648
April	24	53,326	30	86,338
March, 1925	29	96,263	27	88,408

Providence

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1925....	16	52,660	6	27,149
November	6	16,446	8	26,811
October	9	35,405	6	21,232
September	7	21,260	7	22,410
August	3	14,019	5	17,041
July	12	34,835	9	27,767
June	8	34,034	7	28,575
May	15	40,589	9	27,016
April	8	26,506	9	34,277
March, 1925	11	43,757	7	28,136

Portland, Oreg.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1925....	23	86,443	40	144,392
November	28	108,796	37	140,784
October	26	98,371	41	144,397
September	28	103,812	43	158,098
August	16	62,202	23	81,712
July	15	56,181	23	79,132
June	19	64,684	26	85,839
May	11	47,728	20	77,847
April	17	68,981	19	80,425
March, 1925	15	56,297	26	90,025

Baltimore

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1925....	105	314,958	108	332,721
November	106	334,997	99	312,705
October	99	302,522	92	293,425
September	93	264,455	109	310,029
August	109	319,469	104	319,035
July	115	345,191	123	350,375
June	118	343,571	121	353,738
May	118	341,793	129	379,956
April	125	363,563	133	394,223
March, 1925.....	115	344,937	112	322,580

Norfolk and Newport News

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1925.....	24	57,907	100	279,570
November	27	78,573	81	254,439
October	26	51,328	91	248,017
September	39	94,940	85	237,623
August	70	183,064	122	348,475
July	61	163,764	131	347,756
June	81	221,818	152	433,953
May	63	159,186	140	376,657
April	32	84,936	112	308,744
March, 1925.....	26	73,427	100	257,061

Savannah

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
August, 1925.....	34	77,027	39	87,455
July	38	97,332	34	91,981
June	26	60,788	27	60,924
May	27	71,946	22	65,595
April	39	106,938	36	59,574
March	..	.....	...	.....
February	40	101,403	37	91,135
January	33	90,730	33	91,062
December	40	109,496	40	113,538
November, 1924....	36	109,623	39	115,168

Key West

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1925....	89	121,193	88	113,996
November	96	113,222	89	107,091
October	77	91,125	75	90,953
September	76	96,356	73	91,119
August	72	90,106	70	87,924
July	77	94,002	76	91,264
June	87	95,533	85	95,397
May	104	119,502	103	119,729
April	85	103,116	84	102,860
March, 1925	88	105,841	87	115,285

Mobile

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1925.....	104	183,941	89	173,371
November	101	191,490	95	185,722
October	88	258,529	84	161,648
September	80	149,289	76	171,432
August	83	172,872	75	152,613
July	89	180,488	80	160,739
June	86	161,215	79	156,160
May	95	193,841	89	172,419
April	92	190,808	91	180,993
March, 1925	97	215,386	91	197,950

Seattle

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1925.....	47	201,460	55	231,787
November	47	199,055	46	196,343
October	52	203,951	49	207,153
September	42	173,157	43	183,917
August	31	135,105	35	144,874
July	32	137,319	28	130,875
June	34	143,655	41	174,668
May	28	132,043	39	138,570
April	41	156,761	42	173,116
March, 1925	39	168,567	39	157,419

New Orleans

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1925.....	273	750,625	279	764,022
November	261	645,709	232	629,728
October	252	729,058	276	789,419
September	248	655,367	248	680,446
August	257	675,405	253	664,064
July	265	673,711	262	648,474
June	268	679,277	249	609,807
May	256	666,503	276	724,621
April	266	692,569	283	727,156
March, 1925	294	774,343	280	738,445

Houston

(Cargo tonnage)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1924.	99	39,568	102	154,455
November	101	36,016	95	233,436
October	..	34,945	...	192,986
September	94	50,710	90	171,229
August	82	66,665	84	114,966
July	59	77,062	57	288,417
June	65	74,794	72	336,312
May	72	64,937	71	362,350
April	78	76,466	73	337,757
March, 1924 ...	88	113,064	87	411,715

Galveston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
October, 1925	43	98,168	96	302,581
September	33	95,954	72	225,194
August, ...	28	80,524	41	133,058
July	36	100,359	52	141,316
June	47	120,423	57	177,647
May	46	114,702	53	151,098
April	47	107,223	60	171,863
March	55	147,303	75	228,187
February	56	140,065	90	277,751
January, 1925	67	188,781	110	337,882

Los Angeles

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1925....	149	392,707	109	310,852
November	181	398,459	123	337,483
October	261	365,552	183	268,611
September	115	284,493	205	259,437
August	161	344,646	160	295,220
July	133	326,692	119	285,624
June	162	382,186	102	278,294
May	168	363,843	138	298,066
April	153	316,134	137	262,631
March, 1925	131	359,572	113	281,149

San Francisco

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1925....	135	532,691	153	593,556
November	124	491,579	142	547,770
October	138	517,798	136	511,844
September	135	487,872	144	535,301
August	154	579,197	154	549,844
July	138	517,798	136	511,844
June	135	514,900	96	464,024
May	163	567,001	145	554,483
April	134	472,879	157	517,654
March, 1925.....	129	542,912	139	669,867

Port Arthur

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
December, 1925....	31	86,254	24	71,888
November	40	117,506	42	120,597
October	30	86,652	32	95,695
September	26	101,387	31	88,654
August	22	66,176	23	68,827
July	27	59,956	34	100,395
June	26	67,251	30	83,972
May	28	105,707	42	122,871
April	33	100,595	43	116,485
March, 1925	38	95,977	45	110,248

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Washington Irving-Hendrick Hudson
DeWitt Clinton Alexander Hamilton

and now the

Robert Fulton

the last of the Hudson River Day Line
large passenger steamers
All Equipped With

Peabody Fisher Wide Range Oil Burners

made by

The
Peabody Engineering
Corporation

Combustion Engineers and Manufacturers of
Oil—Gas and Pulverized Coal Equipment

110 East Forty Second Street **New York**

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Late Flashes On Marine Disasters

Brief Summaries of Recent Maritime Casualties— A Record of Collisions, Wrecks, Fires and Losses

Name	Date	Nature	Place	Damage Resulting
Aylestone	Nov. 19	Ashore	Beauport Coast	Not stated
Anna C. Minch	Dec. 4	Ashore	Fox Point	Floated-leaking
A. F. Davison	Nov. 27	Ashore	Tarpaulin Cove	Floated
Arabian	Nov. 30	Ashore	Vercheres	Floated
Asturias	Nov. 3	Grounded	Stromningsbaden	Floated
Audy	Nov. 2	Grounded	Sarawak river	Bottom
Alda	Nov. 9	Collision	San Francisco	Stem-leaking
Amber	Nov. 13	Ashore	Clee Sands	Not stated
Airedale	Dec. 6	Ashore	Conders Island	Not stated
Ashton	Dec. 5	Collision	Antwerp	Not stated
Australien	Nov. 20	Collision	Balboa	Not stated
Agility	Nov. 19	Explosion	Preston	Not stated
Aylestone	Nov. 20	Aground	Quebec	Rudder
Albertolite	Nov. 23	Fire	Not stated	Considerable
Adriana	Nov. 23	Ashore	Canical	Filled
Bertha V	Nov. 13	Stranded	Providencetown	Floated
Boston	Nov. 16	Ashore	Bird Island Flats	Floated
Beulah Mae	Nov. 17	Struck	On Burnt Point	Sank
Blanche Ring	Dec. 3	Fire	Nantucket	Damaged
Blairgowrie	Nov. 13	Grounded	Oslo	Floated
Brookdale	Nov. 16	Grounded	Nr. Genoa	Floated
Belona	Nov. 16	Collision	Ystad	Not stated
Bittern	Nov. 19	Disabled	Antwerp	Engines
Batavier V	Nov. 20	Collision	Rotterdam	Not stated
Broxvik	Nov. 15	Collision	Canal	Not stated
Belgique	Nov. 23	Fire	Buenos Ayres	Cargo
Cleveland	Nov. 23	Ashore	Brunshausen	Floated
Campania	Nov. 17	Storm	Not stated	Sank
Cairnavon	Nov. 2	Ashore	Not stated	Badly
Calcite	Nov. 2	Grounded	Chicago River	Floated
Charles L. Hutchinson	Nov. 2	Ashore	Off Kewanee	Floated
Carthage	Oct. 31	Collision	Falmouth	Not stated
Coombe Dingle	Nov. 10	Disabled	Havre	Propeller
Clan Matheson	Nov. 16	Collision	Stobcross	Not stated
Clan Mackay	Nov. 18	Fire	Not stated	Considerable
Campidoglio	Nov. 17	Collision	Venice	Not stated
Carrowdore	Nov. 19	Collision	Mersey	Not stated
Campania	Dec. 5	Collision	North Point	Ashore
City of Rome	Dec. 8	Disabled	Charleston	Machinery
Carriso	Dec. 5	Aground	Columbia River	Floated
Comal	Dec. 4	Aground	Off Gadsden Point	Floated
Commerce	Nov. 24	Sprung leak	Cattewater	Sank
Don Jose	Nov. 19	Sank	Off Formosa	Not stated
Dolly	Nov. 12	Grounded	Requejada	Floated
Defender	Nov. 16	Collision	Not stated	Hull, stern
Delta	Nov. 25	Stranded	Madeytos	Not stated
Doris	Nov. 27	Disabled	Hull	Engine
Emily E. Burton	Nov. 23	Disabled	Cove Point	Not stated
Edward Munch	Nov. 5	Disabled	Hamburg	Engines
El Segundo	Nov. 9	Collision	San Francisco	Leaking
Enrichetta	Dec. 7	Disabled	Carthagena	Main shaft
Eclipse	Dec. 3	Collision	Cuxhaven	Not stated
E. H. Stinnes II	Nov. 20	Aground	Gisko	Total wreck
Ethylene	Nov. 24	Collided	Waterloo Bridge	Not stated
Ebba	Nov. 25	Aground	Nr. Memel	Not stated
Enid	Nov. 26	Collision	Sea Mills Reach	Sank-floated
Errington Court	Nov. 25	Aground	Quarantine Dock	Floated
Frankrig	Nov. 16	Collision	Ystad	Not stated
Frederik Fischer	Nov. 17	Collision	Brunsbuttelkoog	Damaged
Federal	Dec. 5	Collision	Antwerp	Bow, stem
Foldenfjord	Nov. 19	Aground	Nr. Baton Rouge	Floated
G. A. Flagg	Nov. 17	Disabled	Key West	Machinery
Gertrude Schroeder	Nov. 4	Ashore	Oland	Waterlogged
Gov. John Lind	Dec. 7	Aground	Channel	Floated
Groix	Nov. 19	Collision	River Elbe	Serious
Gowan	Nov. 27	Ashore	Bridlington Bay	Not stated
Glenpool	Dec. 10	Ashore	Tampico Bar	Not stated
Hollowell	Nov. 24	Ashore	Above N. Point	Not stated
Horace M. Bickford	Nov. 21	Foundered	Not stated	Not stated
Harry G. Deering	Nov. 24	Disabled	Key West	Leaking badly
Hedge Fence	Nov. 11	Collision	Vineyard Sound	Sank
Hermopolis	Nov. 16	Disabled	Salonica	Engines
Hesperos	Dec. 7	Hvy. weather	Not stated	Deck
Hannawa	Dec. 5	Aground	Columbia River	Floated
Harry Herbert	Nov. 26	Hvy. weather	Old Harbour	Leaking
Helouan	Nov. 27	Collision	Alexandria	Not stated
H. W. Brown	Dec. 5	Aground	Miami	Not stated
Iron Duke	Nov. 26	Collision	Sea Mills Reach	Not stated
Irmgard	Nov. 26	Disabled	Off Terschelling	Prop. lost
James P. Walsh	Nov. 14	Struck log	Ashland	Tail shaft
I. L. Reiss	Nov. 21	Ashore	Chicago	Floated
Jules Henry	Nov. 15	Disabled	Brest	Machinery
John C. Meyer	Nov. 28	Ashore	Libby Island	Total wreck
Kenton	Nov. 15	Aground	Swash Channel	Floated
Key West	Nov. 25	Disabled	Scania	Machinery
Katherine	Nov. 5	Disabled	Off South Pass	Engines
Kurt	Nov. 9	Collision	Holtenau	Propeller
Lethbridge	Nov. 18	Aground	Point Edward	Not stated
La Belle	Nov. 21	Aground	Lake St. Clair	Floated
Lord Kelvin	Nov. 6	Gale	Not stated	Considerable
London Queen	Nov. 9	Struck rock	Guernsey	Not stated
Lidvard	Nov. 8	Hvy. weather	New York	Deck
Loyal Citizen	Nov. 23	Fire	Buenos Ayres	Bunkers
Livingston Roe	Nov. 23	Aground	Longue Point	Floated
Lapwing	Nov. 24	Ashore	Dunoon Pier	Floated
Leona	Nov. 15	Struck sub. object	Not stated	Bottom
Mabel E. Gunn	Nov. 20	Fire	Turks Island	Considerable
Maria Enrica	Nov. 20	Collision	Philadelphia	Not stated
Manchurian Prince	Nov.	Collision	Not stated	Forepeak leaking
Mahone	Nov. 25	Ashore	Codroy	Not stated
Miami	Nov. 21	Grounded	Ansonia	Not stated
Marion N. Cobb	Nov. 30	Gale	Not stated	Waterlogged
Mabel Gale	Nov. 4	Ashore	East Nuevitas	Not stated
Madge Wildfire	Nov. 5	Collision	Rothesay Dock	Plates
Maindy Tower	Nov. 5	Disabled	Bay of Biscay	Engine
Minnedosa	Nov. 6	Aground	Wielingen	Floated
M. C. Holm	Nov. 12	Collision	Vineyard Sound	Not stated
Marie Siedler	Nov. 19	Collision	Rotterdam	Not stated
Mombassa	Dec. 5	Collision	North Point	Not stated
Morris and Cliff	Dec. 7	Gale	Delaware	Leaking
Marietta	Nov. 20	Collision	Dungeness	Not stated
Mellanear	Nov. 21	Aground	Belfast	Floated-rudder
Moss Rose	Nov. 25	Collision	Not stated	Stern
Norway	Nov. 15	Aground	Toledo	Floated
Nieuwcappelle	Nov. 15	Aground	River Scheldt	Floated-leaking
New Brighton	Nov. 19	Collision	Rotterdam	Damaged
Narva	Nov. 15	Stranded	Refsnaes reef	Not stated
Orleans	Nov. 26	Grounded	Miami	Floated
Philadelphia	Nov. 16	Sank	Pier 80, New York	Not stated
Pacific Maru	Nov. 16	Fire	Hampton Roads	Considerable
Pleiades	Nov. 19	Not stated	Little Cove	Total loss
Pennsylvanie Lighter	Nov. 19	Sank	Callao	Not stated
Quirinale	Nov. 24	Ashore	Nr. Piabe Light	Floated
Ruvwo Maru	Nov. 16	Disabled	East of Yokohama	Not stated
Rajah	Nov. 30	Fire	Alacran Reef	Not stated
Redbird	Nov. 30	Aground	Pacific Reef	Not stated
Romera	Nov. 16	Collision	Stobcross	Davits
Risorgimento	Nov. 17	Collision	Venice	Sank
Rose	Nov. 15	Collision	Not stated	Not stated
Ryuho Maru	Nov. 18	Collision	Shimonoseki	Sank
Sea Gull	Nov. 16	Disabled	Nantucket Shoals	Not stated
Severn	Nov. 17	Fire	Elizabeth River	Total loss
Sidney M. Hauptman	Nov. 19	Collision	Governors Island	Not stated
Sir Hugh Allen	Nov. 20	Collision	Montreal	Not stated
S. N. Somers	Nov. 21	Disabled	Baltimore	Machinery
Susherico	Nov. 23	Ashore	Nuevitas	Floated
Seneca	Nov. 21	Grounded	Ansonia	Floated
Stettin 3131	Nov. 9	Collision	Hamburg	Damaged-leaking
Stornest	Nov. 9	Collision	Holtenau	Not stated
Spezia	Nov. 13	Disabled	Off Valencia	Wheel
Sydland	Nov. 16	Collision	Not stated	Stem
Sambodja	Nov. 16	Stranded	Gulf Boni	Not stated
Santarem	Nov. 16	Disabled	Fernando Noronha	Prop. Shaft
Schwinge	Nov. 16	Collision	Brunsbuttelkoog	Damaged
Seminole	Nov. 19	Collision	Mersey	Not stated
Selkirk	Nov. 14	Fire	Montreal	Total loss
Surville	Nov. 20	Struck bridge	Sluiskil	Not stated
Surya	Nov. 26	Sank	Not stated	Not stated
Suiyang Maru	Nov. 26	Collision	Woosung	Bows, stern
Sveajarl	Dec. 12	Ashore	Melbourne	Not stated
Therese Horn	Nov. 16	Disabled	Bermuda	Prop. blades
Tananger	Nov. 25	Aground	Above Brake	Floated
Tom Beattie	Nov. 26	Ashore	Dipper Harbor	Total loss
Tello	Nov. 18	Aground	Nr. Rorvik	Floated
Uncle Ned	Nov. 6	Grounded	Lambay Island	Floated-leaking
Utilla	Dec. 6	Aground	Scituate	Not stated
Ville De Reims	Nov. 24	Disabled	Reunion	Propeller
Wilhelm A. Reidemann	Nov. 14	Aground	Staten Island	Floated
Westway	Nov. 13	Ashore	Nr. Briar Island	Not stated
W. F. Raprich	Nov. 25	Ashore	Nr. Hope Island	Floated
West Jester	Nov. 22	Disabled	S. W. San Francisco	Lost wheel
William Russel	Dec. 1	Not stated	Off Olympia	Wrecked
Wurttemberg	Nov. 2	Aground	Not stated	Floated
Wigbert	Nov. 3	Ashore	Nr. Blankenese	Floated
West Celina	Nov. 18	Fire	Hamburg	Considerable
William Thomas	Nov. 4	Aground	Annisquam Bar	Leaking
Westlea	Nov. 19	Fire	Constantinople	Bunker
W. C. Frohne	Nov. 18	Ashore	Flensburg	Floated
Whinstone	Nov. 25	Aground	Nr. Donna Nook Cdg. Sta.	Sank
Yoshinoyama Maru	Nov. 16	Gale, struck rock	Wakand	Ashore

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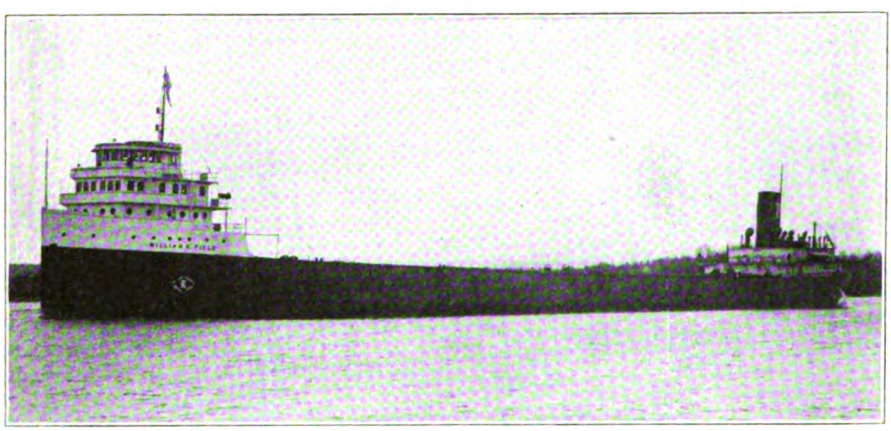
TOLEDO - - - OHIO

Builders of the World's Record Cargo Ship



Steamer William K. Field

604 ft. Long, 60 ft. Beam, 32 ft. Depth. Deadweight Tonnage 12000

OVER half a million tons of freight carried—forty six cargoes of ore and coal delivered in seven months and seventeen days by the steamer William K. Field.

This remarkable performance earned her the title, "Champion Freight Carrier of the World". During the season 1924 on the Great Lakes she registered a total of 552,014 tons. *An unprecedented accomplishment!*

The William K. Field is owned and operated by Reiss Steamship Company, Cleveland, Ohio. Her type of construction permits rapid loading and discharge of cargo. This was an important factor in her record breaking performance.

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Deepen Barge Canal

(*Continued from Page* 19)

Lakes is a question that has been discussed with considerable sectional bias. Sectional politics have handicapped each project from its inception. One weakness in our past waterways policy has been that the engineers employed or in the public service generally recommended the things that the majority of those with a sectional bias desired to have recommended. And as between these two waterways, it is doubtful if even from the purely economic view of the shipper and operator an argument could be contributed or a conclusion reached that would be accepted as satisfactory by even the unbiased.

The operator and citizen engaged in Great Lakes shipping generally has other industrial connections which give him the control of much of the cargo carried in these specially designed freighters. Such an operator is seldom frightened at the prospect of competition or selfish in the matter. And while it has not been definitely determined just what effect the opening of the St. Lawrence ship canal might have on Lake shipping, he is convinced that if this waterway will bring about what is claimed for it, then the general stimulation of industry will more than offset any ill effects resulting from the appearance of ocean vessels in his present domain. If this ship canal is built and the ocean ship does not appear and stay, then his field of operation will have been enlarged and to that extent he will be benefited.

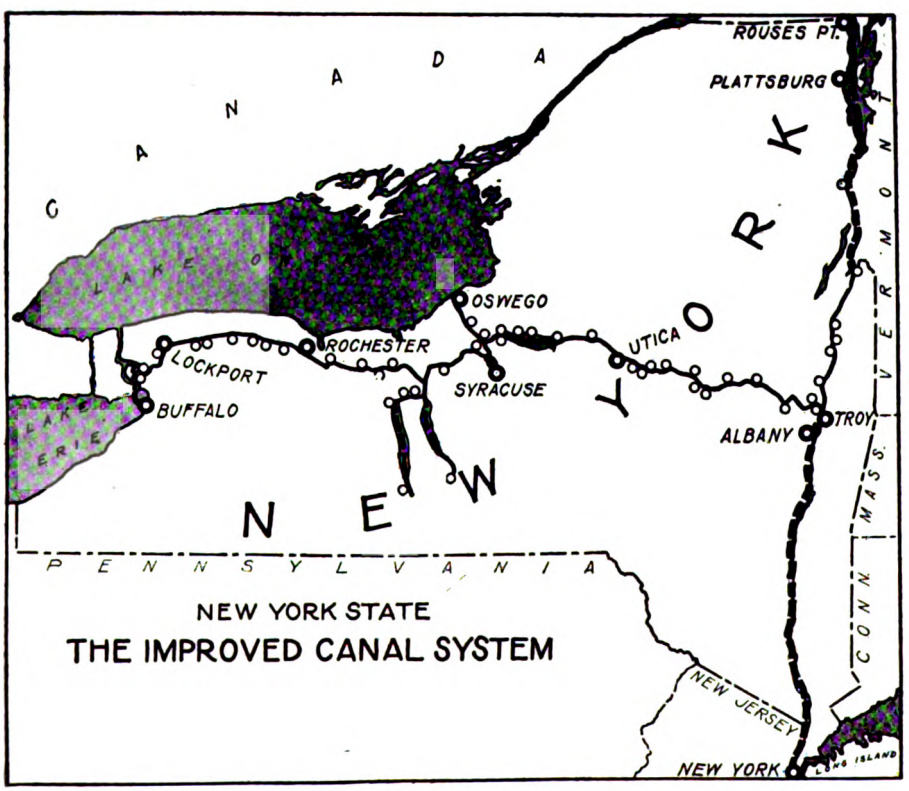
TWIN PORTS—ONE OF TWO DIESEL-ELECTRIC TWIN SCREW VESSELS OF THE MINNESOTA-ATLANTIC TRANSIT CO. WITH A CARGO OF SUGAR FROM NEW YORK—DISCHARGING AT A SAND DOCK IN CLEVELAND HAVING MADE THE VOYAGE THROUGH THE BARGE CANAL—THIS VESSEL IS 258 FEET LONG BY 42 FEET BEAM BY 18 FEET 9 INCHES MOLDED DEPTH

Old and New Welland Canal

The present Welland and St. Lawrence canals have locks forty-five feet wide by 270 feet long and were designed to provide 14-foot draft over the sills. However, the water level of Lake Erie has gradually lowered until but 12½ to 13 feet remains at the entrance of the Welland canal. This is attributed to the deepening of the Lake channels, the stripping of forests from the watershed and the sucking of sand and gravel from the upper Niagara river assisting the run-off and scouring the natural weir that holds back the water and governs the level of Lake Erie. The diversion of 10,000 cubic feet of water per second through the Chicago drainage canal is a very serious loss and it is calculated has lowered lake levels six inches.

Canada is constructing a new Welland canal with locks 80 feet wide and 859 feet long with a 30-foot draft over the sills. In this new canal the number of locks have been reduced from twenty-six for the present canal to only eight, and the approximate running time will be cut down from thirteen hours to four and one-half. An illustrated account of the progress made in building the new canal will be found on page 15 of this issue of MARINE REVIEW.

The completion of the new Welland canal will definitely fix the western terminus of the New York State barge canal between New York and the Great Lakes at Oswego. This was foreseen by lake shippers when the New York canal improvement was contemplated. They volunteered their aid and support for a larger canal if the project could be made national, but New York state desired control over it. Disparing of being able to carry a state referendum without the support of western New York it was considered politically expedient to build 150 additional miles of canal paralleling Lake Ontario to Buffalo. As a compromise the shipper desired to have the locks in the canal between Oswego and Waterford made 14 feet in place of 12 feet deep, hoping at some future time to make the channel conform. The additional cost was estimated at



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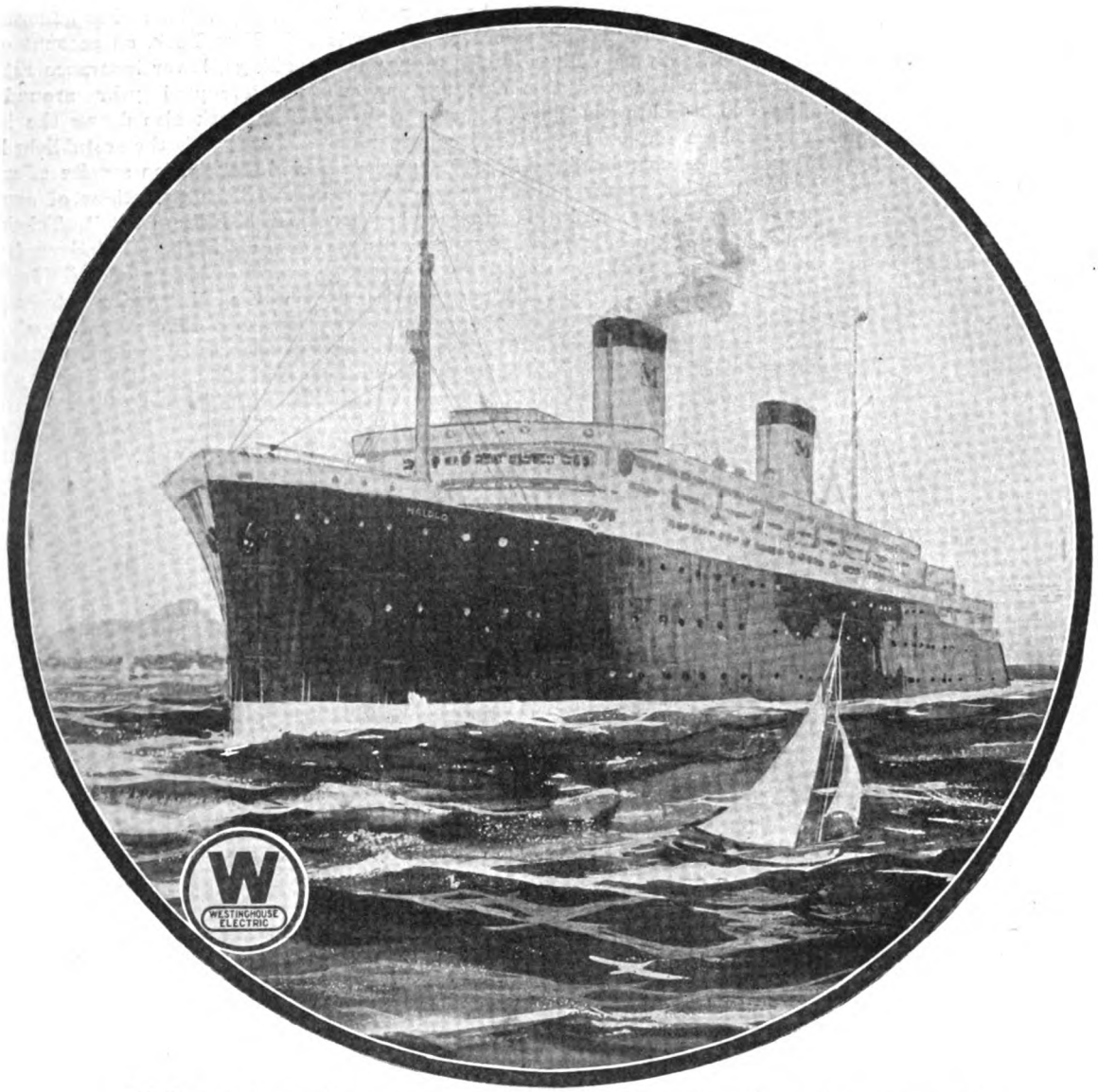

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Selected For

S. S. MALOLO

The Largest Passenger Ship ever built in American Yards

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Westinghouse Electrical Equipment has been selected to furnish all light and auxiliary power.

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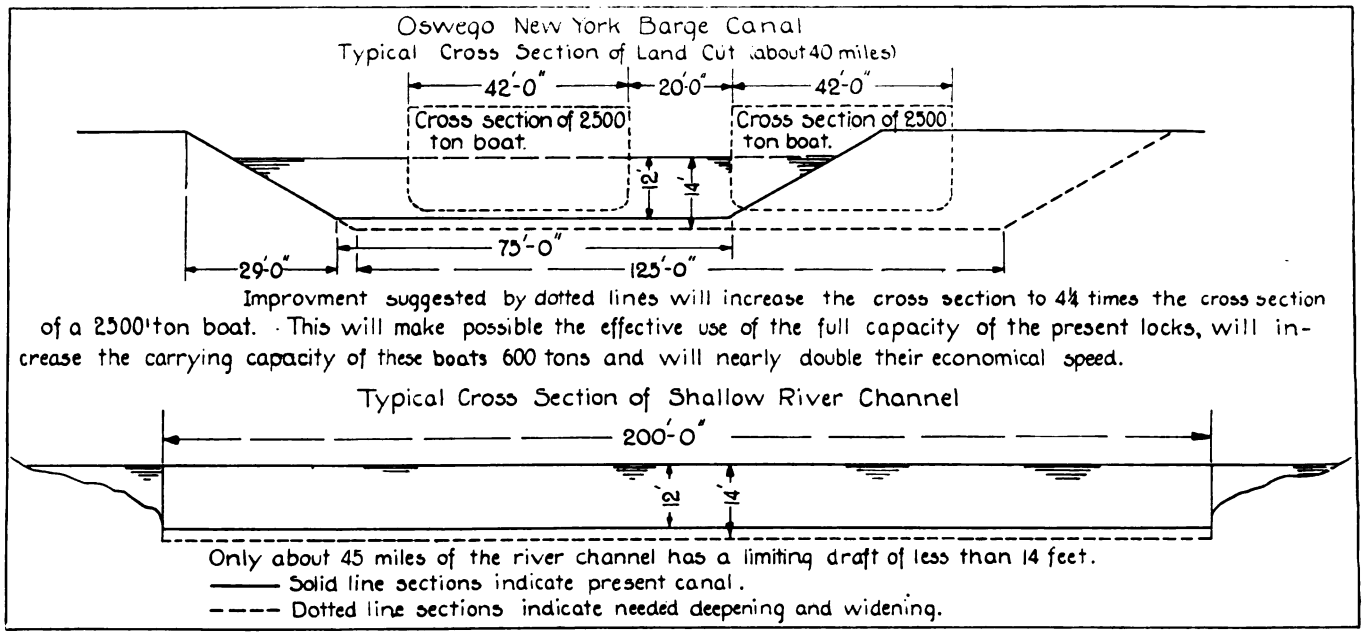
about $2,000,000 and it was recommended by the engineers, but Buffalo interests would not consent. Joining with others they took a postiion similar to the one now taken by Montreal, Quebec and New York with respect to the St. Lawrence development. Buffalo would not support a waterway that did not involve a transfer at their port. The lake shipper and operator, in general, is not interested in water transportation in which this transfer is involved. On that basis the present canal is a failure.

There is no lack of effective argument to justify the expenditure of $257,000,000 to provide a St. Lawrence ship canal, and eventually it should be built. Its principal justification is the lowering of transportation costs on grain and other farm products from the Northwest.

The difficulty is that the close of navigation follows so closely the threshing season that only a small part of the seasons crop can profit from water transportation through the St. Lawrence. The Canadian government is building the Hudson Bay railroad to connect the transcontinental lines with Port Nelson on Hudson bay. About $6,000,000 has already been spent on this port, and engineers claim that it can be kept open twelve months of the year; while the port of Montreal is closed about five months each year. The average distance between Saskatoon or the center of the Canadian wheat fields, and Port Arthur or Duluth on the Lakes is about the same as to Port Nelson on Hudson Bay. But the distance from Port Nelson to Liverpool is about the same as from Montreal to Liverpool. Therefore the distance between the head of the Lakes and Montreal will be saved. It is claimed that where it now costs 35 cents to deliver grain to the Atlantic seaboard this cost will be cut to 9 cents via Port Nelson. Only a short section of this railroad remains to be completed. All of it is graded and but ninety miles of steel remains to be laid, and this steel and other supplies necessary were purchased and have been on the ground for six years. The completion of the railroad is opposed by some sections of Canada, and was an issue in the last Canadian elections. It is claimed that the solvency of the Canadian railroads is dependent on the grain traffic, and the eastern harbors propose to share in the business. The eventual opening of Port Nelson will be watched with much interested by everyone interested in transportation; for it is evident that much of the American and Canadian Northwest grain traffic to northern Europe will be permanently lost to the Great Lakes, St. Lawrence and the Atlantic Coast ports, if hopes materialize.


Oswego New York Barge Canal
Typical Cross Section of Land Cut (about 40 miles)
42'-0"
20'-0"
42'-0"
Cross section of 2500 ton boat.
Cross section of 2500 ton boat.
12'
14'
75'-0"
29'-0"
125'-0"
Improvment suggested by dotted lines will increase the cross section to 4¼ times the cross section of a 2500 ton boat. This will make possible the effective use of the full capacity of the present locks, will increase the carrying capacity of these boats 600 tons and will nearly double their economical speed.
Typical Cross Section of Shallow River Channel
200'-0"
12'
14'
Only about 45 miles of the river channel has a limiting draft of less than 14 feet.
Solid line sections indicate present canal.
Dotted line sections indicate needed deepening and widening.

Disadvantages of the St. Lawrence

Among the difficulties that have kept the St. Lawrence waterways operator from building up a satisfactory commerce by water is the short fall season of grain movement and the absence of sufficient return cargo. The St. Lawrence provides a short route from the Great Lakes to Europe. But Europe is in much the same latitude, has a similar climate and European products and industry are much the same and compete with our own. The interchange of these products is discouraged by a high tariff, and what interchange there is carries a high value per ton and is generally shipped via New York, on account of frequent sailings, lower insurance rates and the uninterrupted year around schedule, New York also draws the business on account of the established financial and distribution service offered. There have been exceptions of course as for instance the Detroit, Toledo & Ironton railroad had delivered, this past season, a cargo of rails from Belgium on the Norwegian steamship NICO. However this delivery of rails into the center of America's steel industry cannot be counted on as a permanent thing. Neither could American ships participate in this trade, for the NICO under a foreign flag carried a total payroll of $900 per month. An American boat operating in the Montreal trade, similar in type and size, carries a monthly pay roll of about $1800.

Most of the bulky tonnage, the kind that makes cargo for ships, comes to the Great Lakes section from the Tropics, from South America, and through the Panama canal. This freight in using the St. Lawrence route must pass by New York and when landed on the Lakes has sailed 1200 miles further than via the New York State canal route. In general we sell where we buy and South America has become our best customer and one of the greatest consumers of American wheat in the shape of manufactured flour. This has become our most valuable market and Canadian flour mills realizing this and desiring to share in it are outfitting two ships to ply between Lake Ontario ports through the New York state barge canal to New York. Yet they have four feet more of water to navigate on via the St. Lawrence. It is an-

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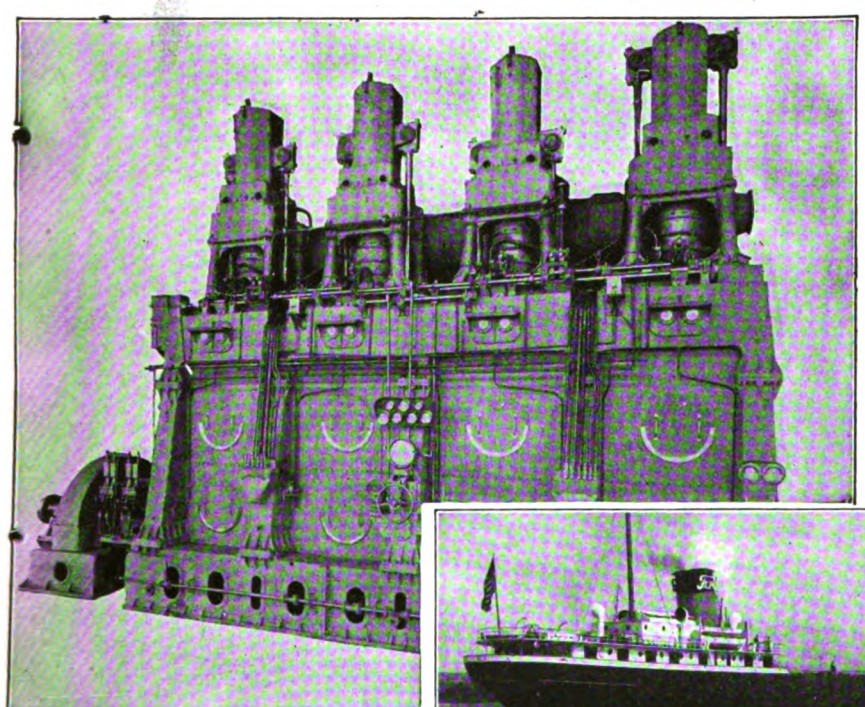
SUN SHIPBUILDING & DRY DOCK COMPANY

Builders of

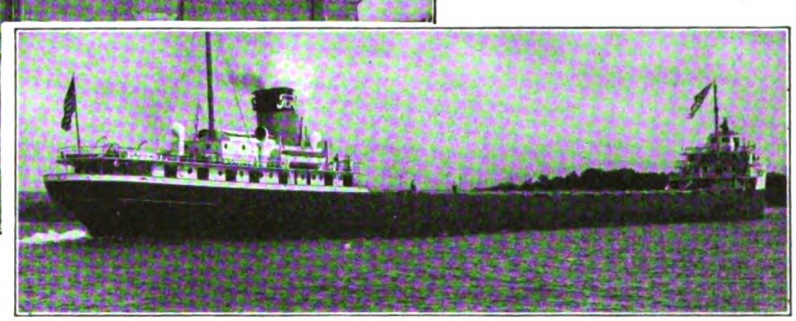
SUN-DOXFORD DIESEL ENGINES

The Engines that Power

"HENRY FORD II" *and* "BENSON FORD"



3000 S. H. P. Sun-Doxford Diesel Engines power the two motorships, "Henry Ford II" and "Benson Ford".



M. S. "Henry Ford II"

SUN-DOXFORD *and* JUNKERS PATENTS

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Chester, Pa. - U. S. A.

Philadelphia Office:
Finance Building

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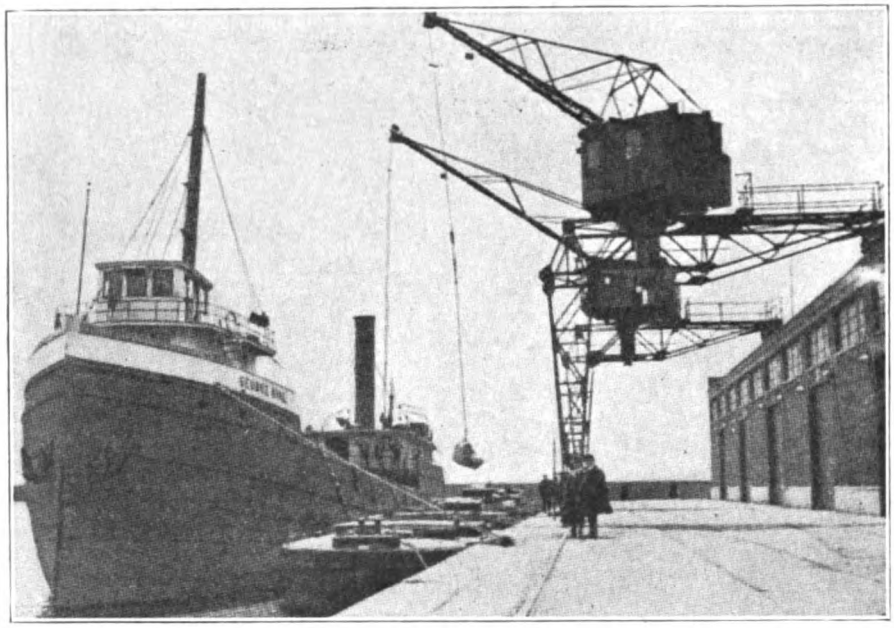
other phase of the struggle to carry on commerce by water between the Great Lakes and the sea.

Make Barge Canal Deeper

The most lamentable feature of the still birth of the Barge canal is that it is used to disprove every argument used by the friends of our waterways. Yet from the standpoint of the operator and the transportation engineer it was doomed to failure from the beginning, through lack of courage on the part of those who controlled its destiny. The original Erie canal paid back its construction costs from tolls collected by the state. The last improvement to the old Erie was authorized in 1835 and two more feet was made available after twenty-seven years.



LAKE VESSEL OPERATED BY W. S. FALLON—LOADING SUGAR FROM CANAL BARGES AT BUFFALO FOR MOVEMENT TO REFINERY ON LAKE ST. CLAIR—WHARF AND EQUIPMENT FURNISHED FREE BY STATE OF NEW YORK—TRANSFER CHARGES, HOWEVER EQUALED CARRYING CHARGES FROM NEW YORK TO BUFFALO ABSORBING ANY CHANCE OF PROFIT

Developments in railroad transportation in the meantime had offset the improvement. In 1880 an economic survey revealed that the 240 ton barge operated on a channel with a cross sectional area of 430 square feet which allowed an economical speed of 3.5 miles per hour had no perceptible advantage over a train of thirty ton box cars operated by a determined competitor. Since that time the average locomotive in freight service has increased in weight from 60,000 pounds to 240,000 pounds and other factors have increased in proportion. And now after fifty years of the world's greatest development era the operator is supposed to bring back to life the trade of this canal and is offered an effective draft of less than three feet additional to do it with. While we were building a five foot canal, Canada was providing nine feet, when we increased to seven feet Canada increased to fourteen feet; and while we were providing twelve feet they started a ship canal with thirty feet draft.

Preliminary to the construction of the present Barge canal, a commission was appointed to visit Europe for the purpose of studying canal conditions prevailing there. The greatest portion of their report was devoted to the highly developed German canals, where the 600-ton barge was standard equipment at the time. A channel and locks to accommodate a consort of one tow barge and three barges of 500 tons capacity each was recommended as standard equipment for the new Barge canal. The comparison of lay time to running time and the length of haul determines the size and type of economical carriers. In Germany on account of the shorter haul the economical freight car is only one-half the size of the standard American freight car. And this relation also applys to boats. Since that time the German canals have all been increased in cross section and the standard carrier is now 1200 tons.

Large Self Propelled Barges

Owing to these factors of time, distance and equipment costs, towing on the Great Lakes has been abandoned, and is no longer useful on the canal. Failures and receiverships have been the reward of those who refused to believe, and still attempted it.

Practically all of the operators realize that the 2500-ton self propelled boat has wonderful possibilities for profit as a carrier. Some of them have been built and operated. The reason they have not been built in great numbers is to be found in the lack of adequate draft and cross section in parts of the channel. This so cuts down their carrying capacity, and so limits the class of profitable freight and profits, that investors hesitate when they consider the ordinary risks and disappointments of the business. Added to this is the total lack of harbor facilities on the Lakes to handle the quantity of, and class of freight they carry.

For the economical propulsion of a boat through a restricted channel it has been determined that the sectional area should be at least four and one-half times the immersed cross section of the boat, and there should be a clearance of at least 2 feet 4 inches underneath the keel. While the locks have an effective draft of 12 feet, the effective operating draft in the 12-foot channel of this canal cannot exceed 10 feet.

Short Space Only Restricted

Of the 340 miles of waterway between Oswego and New York, most of the channel is of ample draft and cross section. Only about one-fourth of the channel is less than 14 feet deep, and only about one-eighth of the total distance has a minimum cross section with a width of 75 feet on the bottom, limiting the speed of the 2500 ton boats to two and one-half miles per hour and making it difficult or impossible for one to pass another in the channel. This restricted section absolutely controls the design of the boats that can be used, increases the hazzard, and limits or makes impossible all profits to the utter despair of the shipper and operator.

This section of the Barge canal should be improved to provide a minimum bottom width of at least 125 feet and a minimum depth of 14 feet at a cost in no way prohibitive. Such improvement would speed up the schedule and increase the carrying capacity by 600 tons per boat. These boats could then operate on the Lakes and in the coastwise trade efficiently and safely, carrying a balanced cargo from the kind of freight offered at a saving to the shipper, rescuing the business from the pauper class, paying tolls if necessary and leaving a satisfactory and substantial profit to the operator. Some idea of the im-

(*Continued on Page* 44)

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WORTHINGTON SERVICE TO THE MARINE INDUSTRY

STARTING about eighty years ago as a builder of pumps which at that time nobody thought were wanted, this organization developed the science of pump design and in the meantime grew to be the largest builder of pumps in the world. In growing the business has expanded its scope until it now includes many types of machinery all more or less closely related to pumping problems.

The products listed below are complete lines which give the freedom of choice necessary to secure the best type for each particular application.

Marine Field

Diesel Oil Engines	Condensers
Circulating Pumps	Vacuum Pumps
Boiler Feed Pumps	Fire Pumps
General Service Pumps	Cooling Water Pumps
Fuel Oil Pumps	Drydock Pumps
Cargo Oil Pumps	Hydraulic Pressure Pumps
Air Compressors	Rotary Pumps

Worthington service is distributed over the world. The offices in the United States are:

ATLANTA.....Wynn Claughton Building	KANSAS CITY.....Scarritt Building
BIRMINGHAM.....1725-31 First Avenue	LOS ANGELES....2424-2426 Enterprise Street
BOSTON...Boston Safe Deposit & Trust Bldg.	NEW ORLEANS.....533 Baronne Street
BUFFALO.....Iroquois Building	PHILADELPHIA...No. American Building
CHICAGO.....Old Colony Building	PITTSBURGH.....Oliver Building
CINCINNATI....First National Bank Building	ST. LOUIS.....Laclede Gas Building
CLEVELAND.....Rockefeller Building	ST. PAUL.....Commerce Building
DALLAS.....Magnolia Building	SALT LAKE CITY.....Walker Bank Building
DENVER.....435 Seventeenth Street	SAN FRANCISCO.....Sharon Building
DETROIT.....Majestic Building	SEATTLE.....Maynard Building
EL PASO.....Mills Building	TULSA.....424 North Boulder Street
HOUSTON.....Southern Pacific Building	WASHINGTON, D. C.....Homer Building

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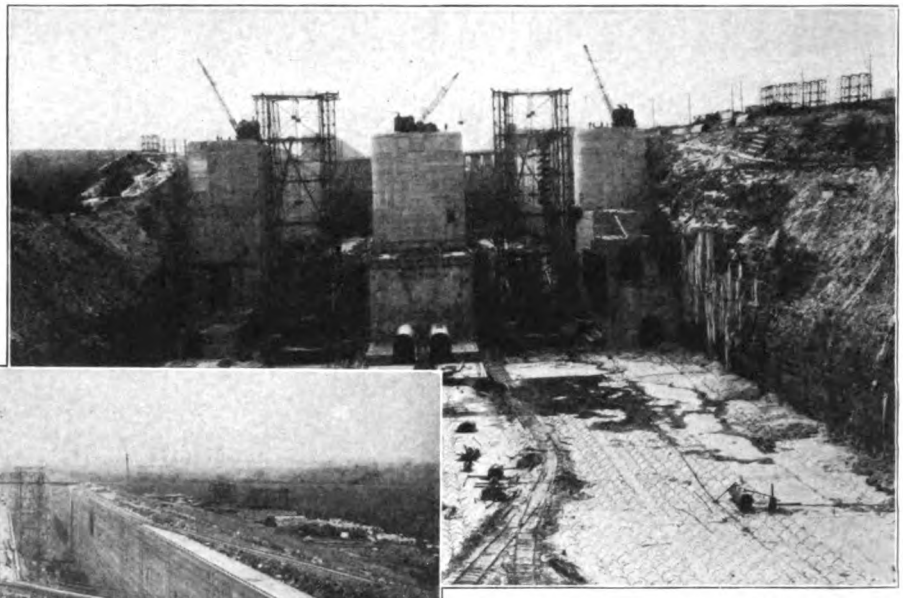
New Welland Ship Canal

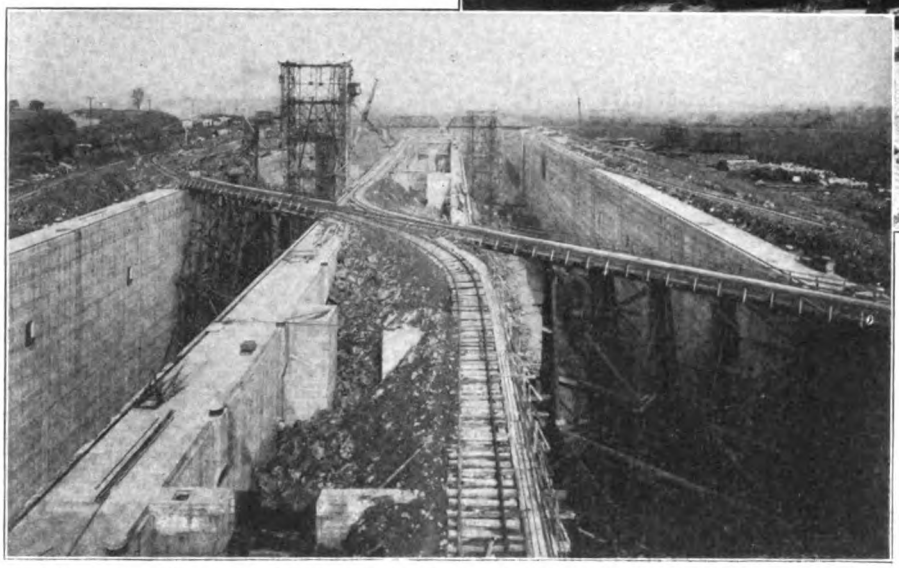
(*Continued from Page* 15)

end of the canal, the new artificial harbor is practically completed. The harbor extends one and one-half miles into the lake.

Locks Nos. 1 and 2 are ready for installation of the gates and operating machinery. Lock No. 3 is 88 per cent complete. Concrete work in twin locks No. 4 is 7 per cent complete, in twin locks No. 5, 94 per cent complete, in twin locks No. 6, 86 per cent complete, in lock No. 7, 89 per cent complete. The placing of concrete for lock No. 8 has not been commenced.



TWIN LOCKS NO. 4 FROM THE CANADIAN NATIONAL RAILWAY BRIDGE—TAKEN DEC. 17, 1925



TWIN LOCKS NO. 5 LOOKING NORTH FROM LOCKS NO. 6—TAKEN NOV. 3, 1925—NEW WELLAND SHIP CANAL

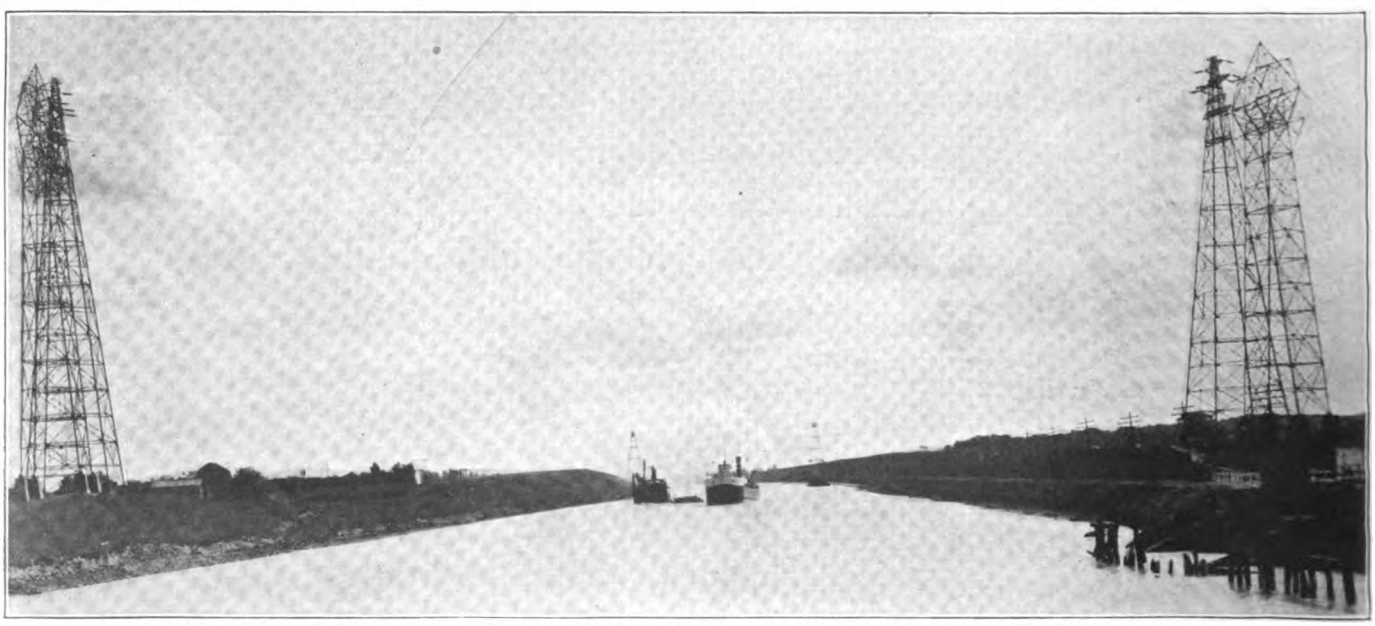
Referring to the map on page 15 excavation of the canal prism, both earth and rock, is nearing completion from Lake Ontario to Allanburg. From the latter place to Port Robinson, it is completed, except in the vicinity of highway bridges. Contracts for the construction of sections Nos. 6, 7 and 8, between Port Robinson and Port Colborne, on Lake Erie, have been let only in recent years and the greater part of the excavation has yet to be removed in this portion of the canal.

The following list gives the estimated quantities of some of the principal items of work involved in the construction of the whole canal, with the percentage completed to March 31, 1925:

Item	Cubic yards	Per cent complete March 31,1925
Rock excavation	8,674,000	43
Earth excavation	46,839,000	48
Watertight embankment	3,462,000	70
Concrete, all classes.....	3,381,000	52

Between March 31, 1925 and Oct. 31, 1925, there were excavated approximately 1,700,000 cubic yards of rock, 2,700,000 cubic yards of earth. And 351,000 cubic yards of concrete were built. Rock excavation is being carried on this winter on sections 7 and 8.

Upon the completion of this canal the eastern terminals of the Great



SUMMIT LEVEL OF WELLAND CANAL FROM ALLANBURG BRIDGE LOOKING SOUTH—TAKEN OCT. 6, 1921

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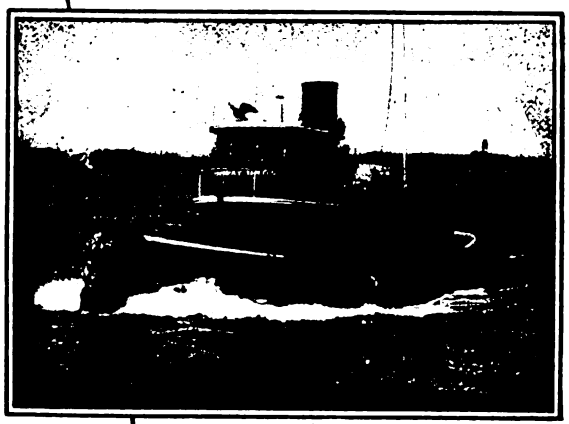
Read what these ship owners say—



STANWOOD TOWING CO.
GENERAL TOWING
WHITEHALL TERMINAL,
FOOT OF WHITEHALL STREET

New York, Dec 28, 1925.

New London Ship & Engine Co.,
247 Park Avenue,
New York City.

Attention Mr. P.L. Sutphen.

Gentlemen:-

Replying to yours of recent date relative to our Tug "Conway Bros." please be advised that the boat has given entire satisfaction since we placed her in service last Spring.

We have used her mainly in towing between New York and Jamaica Bay points, her tows consisting usually of brick and stone scows and her time on this work is far better now than when she was steam equipped and compares favorably with that of our steam tugs of larger horse power. This takes into consideration the making up of tows at 52nd St. N.R. which point has been very much congested, necessitating considerable manoeuvering and in this connection we are pleased by the performance of the four cylinder four cycle engine.

We have been doing one and one half times the amount of work with this boat this year that she did as a steam boat, at a fuel cost of one quarter that of coal, in addition there to, we have fueled nine times in nine months, while as a steam boat during the same period it was necessary for her to fuel sixty times.

We consider that New York Harbor tug boat service is one of the most difficult for any type of boat or machinery, and we are indeed pleased to be able to say that the "Conway Bros." in all respects has exceeded our expectations.

Yours very truly,
Stanwood Towing Co.
James H. Conway
Secy. & Treas.

Last March the tug, "Conway Bros.", was converted from steam to Diesel engine power, being fitted with a Nelseco 220 S. H. P. direct reversible Diesel engine. Since then, operating costs have been reduced materially. Read this letter from her owners.

This is only one of many successful Nelseco Diesel engine installations made by The New London Ship and Engine Co.

Nelseco Diesels are built under M. A. N. patents; in 4-cycle, single acting type, from 100 to 85 H. P.; in 2 cycle, double acting type, from 1,000 to 10,000 H. P. mechanical or air injection; suitable for yachts, tugs, freight and passenger vessels. A 180 H. P. Nelseco Diesel is conveniently placed for your examination at

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247 Park Ave., New York City
Demonstrations made on appointment

LET the Nelseco engineers tell you how easily you can reduce operating costs and increase cargo capacity and profits. Their experience is at your disposal.

Nelseco facilities include both conversion and steel ship building construction.

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Lakes immediately move eastward to the eastern shore of Lake Ontario, and the vicinity of Prescott on the upper St. Lawrence. By this increase in range the value and possibilities of all the marine facilities on the Great Lakes are enhanced. The sailing radius of the large boats will be increased nearly twenty per cent to take in the commerce of Lake Ontario ports, extending the possible water haul 150 miles nearer New York, 200 miles nearer Portland, Me., and shipments may be brought within lighterage distance of Montreal.

Just what effect this extension of Great Lakes navigation will have on American vessels and transportation routes is quite evident. American tariff on wheat and other exportable farm products, provides little protection or difference in price, as all competition centers in Liverpool, and when there is a difference it is in favor of the Colonies. We do not import Canadian grain and the great tonnage formerly carried over American railroads and canals and exported through American ports will not assume the burdensome restrictions of being forwarded in bond.

A matter of 60,000,000 bushels of American grain has found it more convenient to go through Canada. In consequence Montreal has become the second port in this hemisphere. Two new boats are being built for Canadian registry, the largest on the Lakes and there will be others. It is presumed they will carry to Ontario ports. American boats cannot compete in the Montreal trade. The demand for tonnage at the end of the season sometimes raises the rates sufficiently to attract them, but most of our boats are permanently out and there is little indication that it will ever be different. But the approaching completion of the Welland ship canal should bestir American interests to deepen and widen the present waterway from Oswego to New York. The Canadians are setting us a lesson in foresight and energy.

Deepen Barge Canal

(*Continued from Page* 40)

portance of two additional feet depth can be gained from the fact that $3,000,000 was lost to the steamship operator on the Great Lakes this past season due to the lowering of the lake levels by six inches. Any improvement that is made cannot be final, but should be undertaken with the idea of progressively improving this canal from time to time.

The Great Lakes' states realize they have no right to demand that taxpayers of the Empire state be called upon to finance this improvement. It is the only all American route available that follows the natural traffic route to the Atlantic seaboard. Its benefits are national or international and it should be a part of the national waterways system, financed in so far as possible by those who receive the benefits. The fact that it is not now a national waterway can be attributed to the importance, in the past, of its power and transportation possibilities. However we do not control the situation, no more than does that part of Canada which would directly benefit. The difficulties are very real and it seems doubtful if this generation will enjoy its benefits. During a time of great national stress when a waterway to the Atlantic would be imperative, Canada might be called upon to deny us the use of the St. Lawrence canals or be compelled to

S. S. NICO AT CLEVELAND, SEPTEMBER, 1925—NORWEGIAN FREIGHTER OPERATED BY THE LANE STEAMSHIP CO. TAKING ON A CARGO OF METAL PRODUCTS, PAINTS AND MANUFACTURED ARTICLES FOR EUROPEAN PORTS

personnel to the political parties of the state.

At present three-quarters of all the freight moving between the Atlantic coast and the Lakes goes by this route and always has rather than via Montreal. If the Oswego canal is brought up and kept abreast of the times there is no economic condition now apparent which would tend to divert this traffic.

The St. Lawrence improvement has ample justification in its combined abandond her neutrality. Foreseeing such a possible embarrassment we should concentrate on a proper waterway of our own.

There comes a time when the great majority to be benefited must rescue the harbors and national waterways from vacillating policies, from sectional selfishness, and powerful opposing interests, to the end that they may take their proper place in a greater and broader plan of national security and prosperity.

Recent Sales of Ships

THE president of the Emergency Fleet Corp. has announced the following sales of ships:

LAKE GALEWOOD, lake-type cargo, 4225 deadweight tons, for $25,000 cash to the Peninsula State Steamship Corp., a recently organized New York corporation. The purchaser agrees to perform certain work of improvement consisting of the installation of side ports and 'tween decks.

WEST CAMARGO, WEST NOTUS, WEST CACTUS, HOLLYWOOD, WEST NILUS and WEST MAHWAH, ocean cargo vessels, each of approximately 8800 tons deadweight, for $49,500 per ship, to the McCormick Steamship Co. of San Francisco, for five years guaranteed operation in the Pacific-Argentine-Brazil service. This is the first sale to be made by the board in a service operating exclusively cargo ships from the Pacific coast.

LAKE BUTLER, lake-type cargo, 2875 deadweight tons, for $30,000, to Asa F. Davison. This vessel is the last of the small lakers of the board's fleet.

RUSHVILLE, lake-type cargo, deep draft oil burning, 4095 deadweight tons, built by the Toledo Shipbuilding Co. April 1920, to Henry Kuntz, for $42,000, to be used for the transportation of building materials to Florida.

LAKE CRESCENT, lake-type cargo, 2875 deadweight tons, built by the American Shipbuilding Co. in 1918, to the Consolidated Navigation Co. of Baltimore for $30,000. This is one of the small shallow draft lakers and will probably be used in the company's line to Florida.

LAKE GIDDINGS, LAKE FLATONIA, lake-type cargo, 4145 and 4155 deadweight tons respectively, for $61,000 for the two, to the Baltimore & Tampa Steamship Co. The first vessel was built by the McDougall-Duluth Co. in 1919 and the second by the American Shipbuilding Co. in 1920. The Cottman interests

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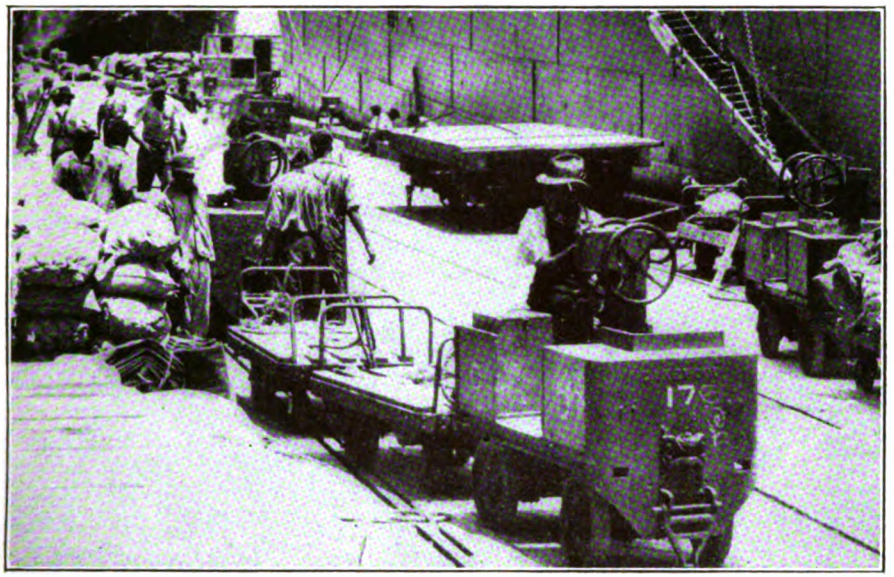

The electric industrial truck is a most economical means of freight handling. How economical, however, depends a great deal upon whether you equip your trucks and tractors with the storage battery described upon this page.

How to deliver more freight in quicker time, at less cost

THERE is one thing you can do to speed up your small freight handling service and keep down its cost. Namely, put in your electric industrial trucks and tractors a storage battery that will drive those machines at a good fast speed all day long—whether on the level or up grade. Let it be a battery, furthermore, that lasts for years, doesn't cost too much in the beginning, and is built ruggedly enough not to get out of order. You can get such a battery by specifying the Exide-Ironclad. If you want proof, ask any of the many prominent steamship companies that have put Exide-Ironclad Batteries in their industrial trucks and tractors. The names of a few of these companies are listed below.

A few well-known steamship companies that use Exide-Ironclad Batteries in their electric industrial trucks and tractors:

Kerr Steamship Company, New York
Hudson Navigation Company, New York
Luckenbach Steamship Company, Philadelphia
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French Line, New York
New England Steamship Company, New York
Eastern Steamship Company, New York
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Write for this booklet of interesting facts and valuable information about storage batteries. It is sent you without charge.

Exide IRONCLAD BATTERIES

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia

Exide Batteries of Canada, Limited, 153 Dufferin Street, Toronto

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of Baltimore are back of this steamship company.

LAKE FITHIAN, lake-type cargo, 4230 deadweight tons, for $25,000 cash to William Clifford of Duluth, Minn., built by the Globe Shipbuilding Co. November 1919. The purchaser is to use this vessel in a land reclamation project in the south, together with the S. S. LAKE ELLENDALE recently sold by the board.

WESTERN KNIGHT, WESTERN GLEN, WESTERN ALLY, WEST ISLETA and WEST CAWTHON, ocean cargo vessels, of 8640, 8645, 8514, 8742 and 8554 deadweight tons each, respectively, for approximately $782,000 to John M. Franklin as agent for the American South African line, a corporation to be formed under the laws of the state of New York. Operation for a period of five years with not less than 12 voyages per annum in the South and East African service, according to the conditions of the sale, was guaranteed by the purchaser.

This sale represents the fifth important disposition of established lines during the calendar year 1925, the other lines sold being the California Orient line, 5 combination passenger and cargo vessels for operation between San Francisco and Manila and Japanese and Chinese ports; the American Palmetto line, of 6 cargo vessels between the South Atlantic coast and the United Kingdom and Continental Europe; the American Export line, of 18 cargo vessels between the North Atlantic and the Mediterranean, Black Sea, Spanish Atlantic and Portuguese ports and North African Atlantic ports; and the Pan American line, of 4 combination passenger and cargo vessels operating in the South American trade.

JEPTHA, DEPERE and DERBLAY, ocean cargo vessels, of two-deck type, 5127, 5136 and 5118 deadweight tons each respectively, built by the Hanlon Dry Dock & Shipbuilding Co. late in 1920, to the Alaska Steamship Co., New York City, for the sum of $270,000 cash. These are the only remaining vessels out of a group of ten, two of which were purchased by this same company for its Alaskan service; four others having been purchased for operation by another concern between Baltimore and Porto Rico; and one other by a salmon concern for operation with its fishing fleet.

World Markets

YORKHILL, single deck steamship, 6080 deadweight tons, 3585 gross tons, for about £12,500 to Monument Steam Navigation Co., London, for Japanese buyers.

MANCHESTER EXCHANGE, single deck steamship, 6559 deadweight tons, 4091 gross tons, for about £16,000 to the Manchester Liners Ltd., Manchester, for foreign buyers.

MATTI, single deck steamship, 3600 deadweight tons, 2139 gross tons, for about £17,000 to Carl Beck & Co., Norway for Japanese buyers.

MOIRA, single deck steamship, 3292 deadweight tons, 2184 gross tons, for about 8000 pounds to the Australasian United Steam Nav. Co., London, for Japanese buyers.

Seamen Discharge Books

SEEKING a change in the LaFollette seamen's law to provide for the use of continuous discharge books for seamen on American vessels and to enable seamen to leave vessels when in port without facing charge of mutiny, representatives of marine labor unions have been appearing before the senate commerce committee in support of the bill introduced recently by Senator LaFollette, of Wisconsin.

The bill also would permit seamen to have an outside party present when shipping articles between the crews and vessels are signed. The committee has had under consideration the new LaFollette bill. The unions were represented chiefly by Andrew Furuseth, president of the International Seamen's Union of America.

Under provisions of the measure the continuous discharge book for seamen would be issued by the United States through its shipping commissioners and would show a description of the holder, the date and place for signing on for each voyage, together with the nature of the voyage, the name of the ship, the rating of the seaman at the time of shipping and the date of discharge and the rating at that time.

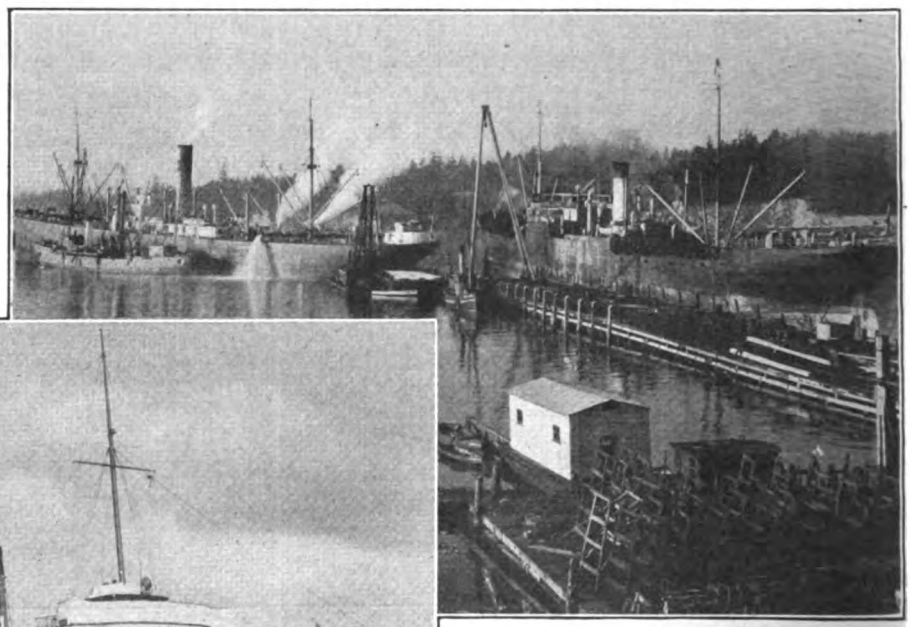
It was pointed out by the union representatives that while some continuous discharge books contain a column for the notation of the character of the service rendered by the seaman on the voyage, the new LaFollette measure had omitted this provision because, it was charged, it has been abused in the past.

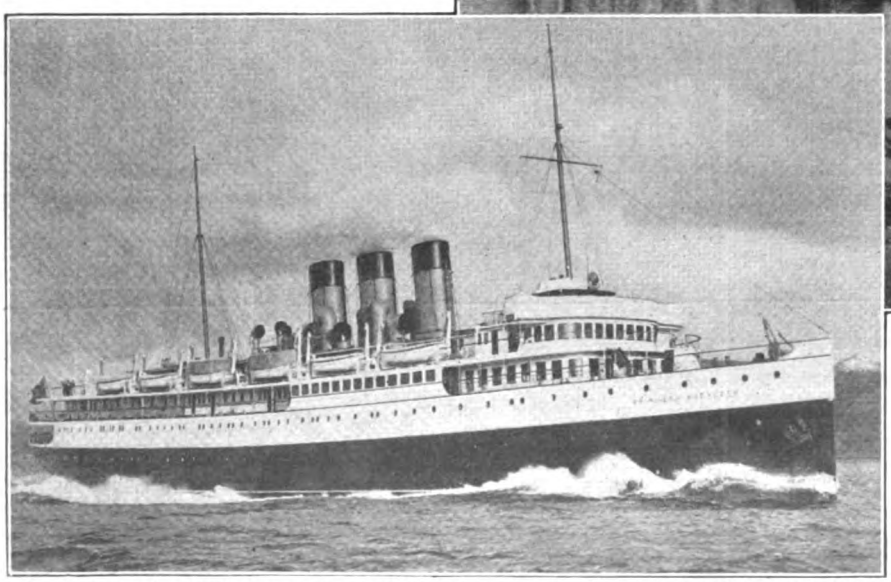
Union men said that where private discharge books have been used with such a column, inefficient work was cited on the part of seamen because of the personal dislike element.

Canada's Pacific Gateway

(*Continued from Page* 27)

The dock is operated electrically. There are three 54-inch main pumps and two 22-inch auxiliary pumps, and the dock can be emptied in four hours. The water is pumped out into the sea through a tunnel 600 feet in length measuring 9 feet by 14 feet. When filled, the dock contains 42,000,000 gallons of water.





S. S. PRINCESS KATHLEEN—SPECIALLY BUILT ON THE CLYDE WITH HER SISTER SHIP THE PRINCESS MARGUERITE FOR THE TRIANGLE RUN BETWEEN VICTORIA, SEATTLE AND VANCOUVER—SHE IS OVER 6000 GROSS TONS AND HAS A SPEED OF 23 KNOTS

YARROW'S SHIP REPAIR PLANT AT VICTORIA

Charges for Use of Old Drydock

Gross tons	First day	Following days
Up to 1000 tons	$ 300	$100
1000 to 1199 tons	350	190
2000 to 2499 tons	400	237
2500 to 2999 tons	550	287
3000 to 4999 tons	650	380
5000 to 5999 tons	850	460
6000 to 6749 tons	875	510
6750 to 7499 tons	950	570
7500 to 8999 tons	1200	690
9000 to 9500 tons	13000	760
to 10,000 tons	1400	800

The minimum charge is $100 per

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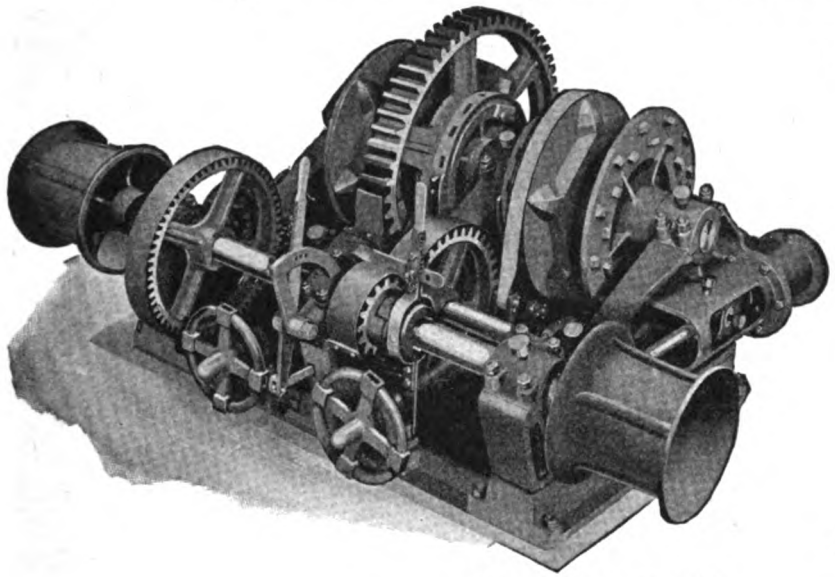
The "Superior" Spur Geared Windlass



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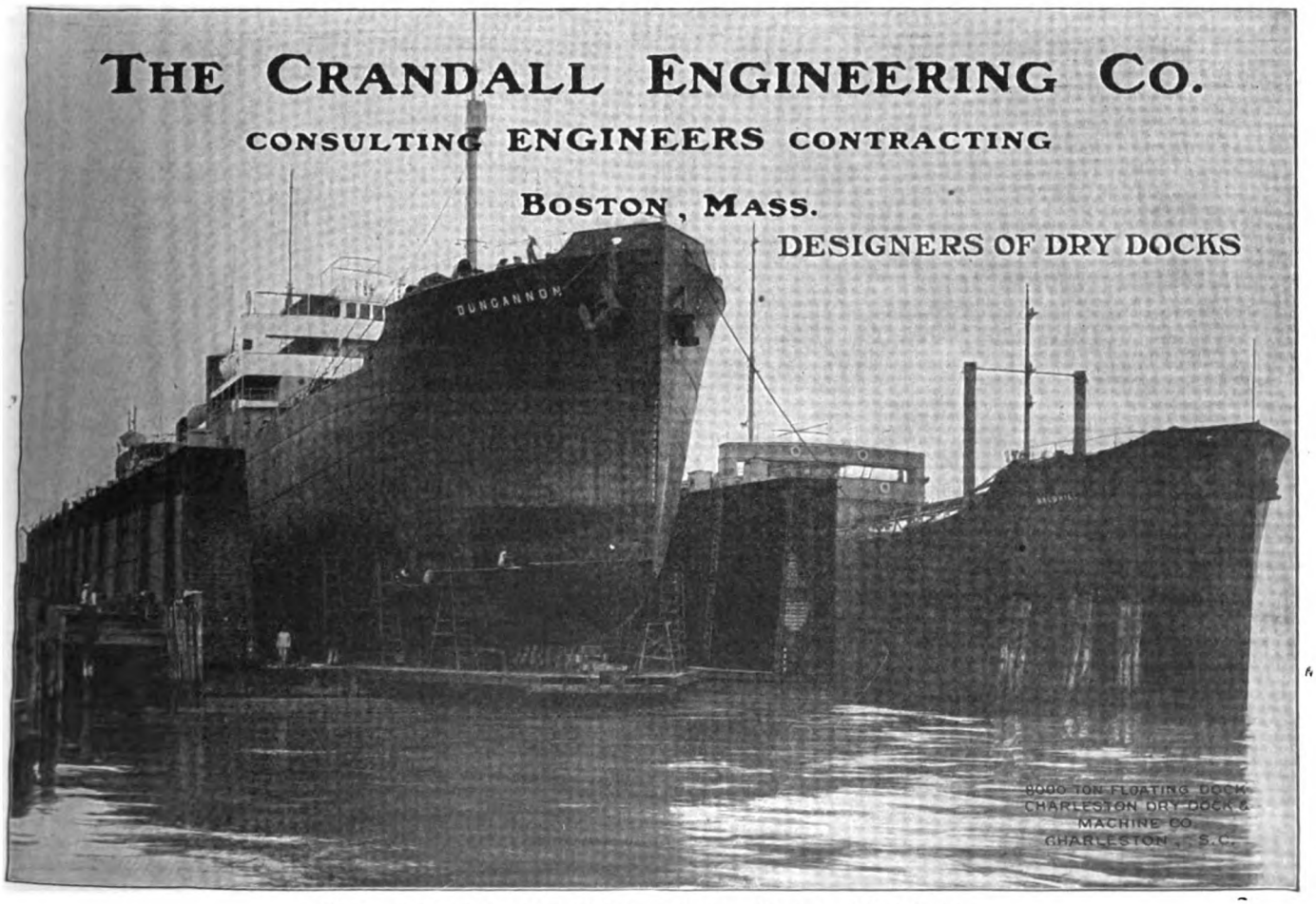

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WHALING FLEET STATIONED AT VICTORIA

day. All vessels over 440 feet in length, requiring keel blocks raised, will be charged $150 for extra pumping. When a vessel is docked solely for painting and scraping, or change of, or repair to propeller, tail shafts and liners, rudder pintels or bushes, the ordinary tariff is suspended and the rate is $200 for the first day of docking and ten cents per ton per day for lay days, the time not to exceed four days in all. No charge is made for Sundays and holidays unless work is done on the vessel. There are first class facilities for outfitting and repairing ships and bunkering either coal or fuel oil, while harbor charges are the lowest on the Pacific Coast.

Pilotage is optional. To or from William Head, Royal Roads or Brotchie Ledge into Victoria or vice versa, a charge is made of 50 cents per foot draft and ½ cent per net register ton to a maximum of 3500 tons. Regular line vessels calling at Victoria more than once on the same voyage are charged one half the above rates for the second or subsequent calls on that voyage. Vessels to or from quarantine, Royal Roads or Brotchie Ledge into any port other than Victoria, Esquimalt and the ports on the Fraser river within the Gulf of Georgia, and as far north as Comox are charged $2.00 per foot of draft and $0.01 per ton net register.

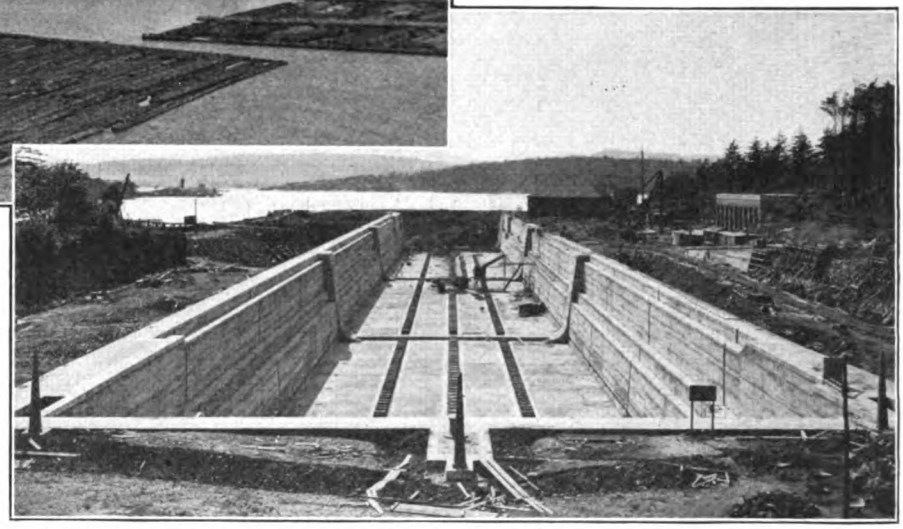
Ordinary Port Charges

Hospital dues, per net ton, payable three times annually	$0.02
Harbor dues, payable twice annually	7.00
Bill of health	1.00
Dockage charge (no cargo landed) for the first 200 tons	4.00
For each additional ton	.00½
Port charges on vessels over 1000 tons, each half year	2.00
Port warden, each survey or visit	8.00

The reason that the port charges are so low is that there is no harbor commission. In fact, Victoria claims to have the lowest port charges of any seaport on the coast.

Vessels requiring the services of a pilot from or to Port Townsend will be charged an extra $10.00 if services are required beyond the international boundary and also $15.00 traveling expenses.

And, finally, to show that Victoria is at last beginning to utilize her wonderful natural advantages as a port, it will only be necessary to add that the British Columbia Salvage Co. last year had built a specially designed salvage steamer, the SALVAGE KING at a cost of $500,000. This vessel has a steaming radius of 10,000 miles and is equipped with all the most modern appliances necessary for successful salvage work. She is recognized as the premier vessel of her kind in the world today.



RECENTLY COMPLETED GIANT DRYDOCK BUILT BY THE DOMINION GOVERNMENT AT VICTORIA—ONLY 29 FEET SHORTER THAN THE COMMONWEALTH DRYDOCK AT BOSTON

Bulk Cargo Movement Grows

Shipments on the Great Lakes for 1925 Compared with Other Years

Year	Iron ore gross tons	Coal net tons	Grain, various kinds net tons	Stone net tons	Total net tons
1925	54,081,298	28,127,359	13,320,346	11,351,948	113,370,707
1924	42,623,572	25,860,515	15,222,787	9,225,624	98,047,327
1923	59,036,704	33,137,028	11,850,446	9,920,422	121,029,004
1922	42,613,726	19,868,925	14,267,020	7,592,137	89,454,848
1921	22,300,726	26,660,652	12,470,405	3,925,705	68,033,575
1920	58,527,226	26,409,710	6,736,348	7,821,980	106,518,531
1919	47,177,395	26,424,068	6,091,703	6,407,285	91,761,238
1918	61,156,732	32,102,022	6,548,680	7,467,776	114,614,018
1917	62,498,901	31,192,613	7,161,716	6,748,801	115,100,399
1916	64,734,198	28,440,483	10,555,975	5,553,927	117,052,686
1915	46,318,804	26,220,000	11,098,815	3,854,106	93,049,981

Draftsmen Wanted

The New York navy yard has a one 10,000-ton cruiser to build and is therefore in immediate need of additional hull draftsmen for preparing plans. Positions are open for 4 ship design draftsmen at $8.08 to $10.16 a day; 14 ship detail draftsmen at, $5.84 to $7.60 a day; 9 copyist draftsmen at $4.64 to $5.04 a day. For full information apply to the secretary, Second U. S. Civil Service district, Custom House, New York.

Withdraw Towboats

The towboats LEOPARD, SAMPSON, DOLPHIN and DONALD G. have been withdrawn from operation in New York harbor because private operators are in position to adequately serve the towing requirements of the harbor.

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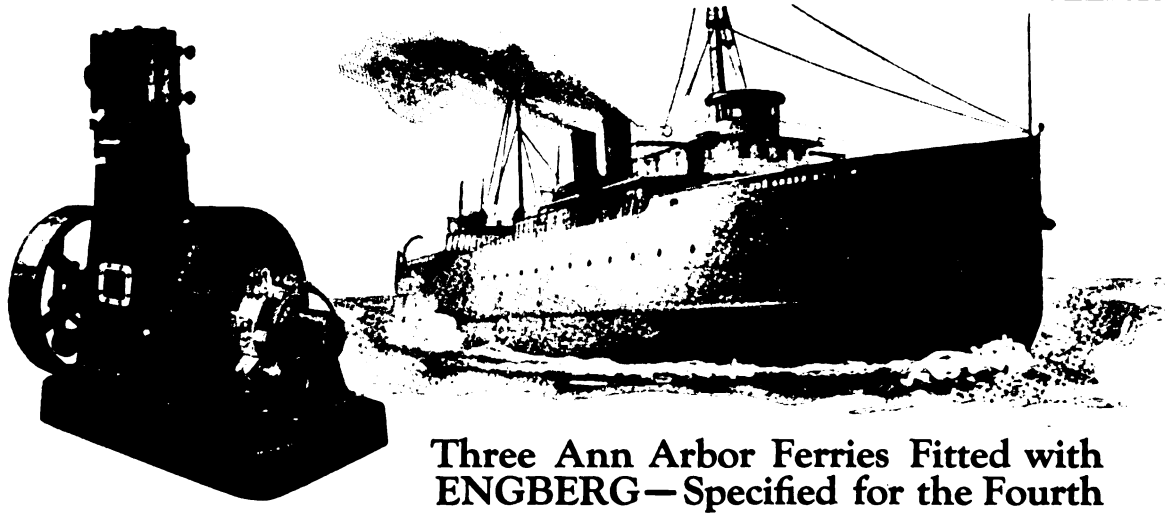

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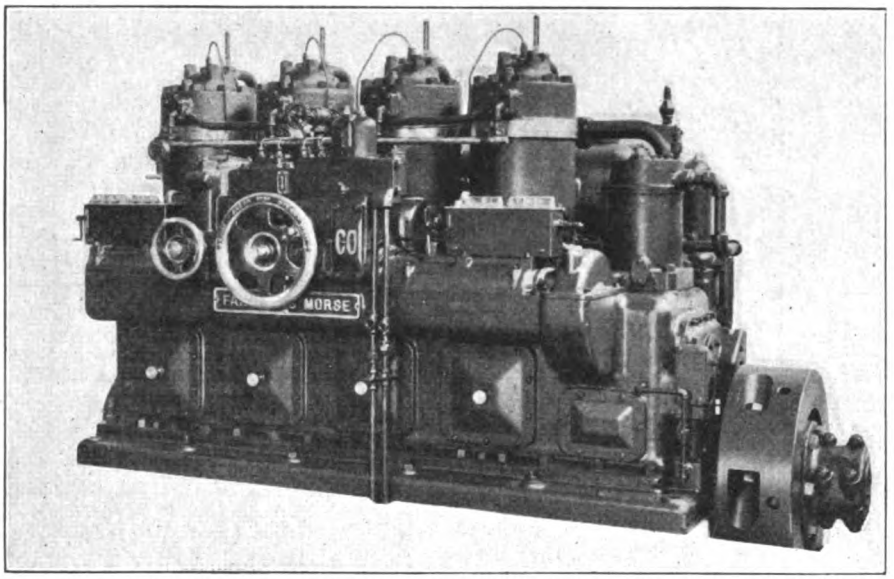
Improved Marine Diesel

(*Continued from Page* 20)

design of this type which will be used for illustration purposes.

Referring to the cross section view of this engine, the first thing which will be noticed is the absence of complicated parts. In the two cycle engine there are no inlet or exhaust valves, as the piston performs these functions. It will be noticed in the illustration that the piston is in the lower dead center position. On its way down to this position the air entrapped in the crank case, which has come through the grid valve is slightly compressed and when the air inlet port is uncovered by the piston this air flows up through the passageway and clears the cylinder of the gases due to the combustion.



CONTROL SIDE OF FOUR CYLINDER UNIT LOOKING FORWARD—TWO CYLINDER SIZES ARE BUILT FOR THE 4 CYLINDER UNIT, GIVING RATINGS OF 240 AND 120 BRAKE HORSEPOWER

On its return stroke, the piston covers both the air inlet and exhaust ports and the charge of fresh air is compressed in the cylinder. As the piston approaches the top of the cylinder, the injection of the fuel oil takes place through the nozzle into the auxiliary combustion chamber. The air which is being compressed rushes through the neck of this chamber and meets the spray from the fuel nozzle and aids in breaking the fuel up into a finely atomized state. In the meantime, the piston has been moving up and the compression pressure has reached about 500 pounds per square inch which raises the temperature of the charge to practically 1000 degrees Fahr. and combustion begins. Slow combustion which now takes place burns the fuel charge to the gas carbon monoxide. All of the liquid fuel is converted into this gas with only small remnants of fuel oil vapor. As the piston moves on the downward stroke the burning gases rush through the neck into the cylinder space and complete combustion of the charge to carbon dioxide takes place.

Expansion Source of Power

It can be seen from this that no ignition devices are required, as the heat of compression fires the charge. There is no explosion in any sense of the word as the fuel burns at a constant pressure due to the fact that it expands into the cylinder and the piston is beginning to move on its downward stroke. As the piston moves on its downward stroke, it first uncovers the edge of the exhaust port and the burned gases pass out through this port and the pressure of the cylinder is lowered to practically that of the atmosphere. When the piston moves slightly farther it uncovers the air inlet port and the air which has again been slightly compressed in the crank case flows through the cylinder, thus clearing out the gases of combustion.

It will be noted from this brief description of the operation that the two cycle engine receives a power stroke at every revolution of the crankshaft. In the four cycle engine, there is a power stroke at every other revolution since the piston on its upward travel must force out the exhaust gases through an exhaust valve which is timed to open at the proper moment. On the downward stroke the piston in the four cycle engine pulls in a fresh air charge through the air inlet valve, which is also timed to open at the beginning of the downward stroke. On the next revolution the charge of air is compressed and the fuel is injected, combustion occurs and the piston again travels down on the expansion or power stroke.

Another imortant feature of marine diesels which must be given careful consideration is the arrangement which is provided for controlling the speed and for reversing. If a boat is to maneuver well the engine must respond quickly to speed changes and reversals of direction which are called for. Here also the modern trend has been for simplification and in the case of the engine under discussion the centralized control has been so perfected that it is a comparatively simple matter to start the engine or to reverse it.

This is accomplished by the use of two hand wheels, one of which takes care of the starting and reversing and the other, the variation in speed. All that is necessary in starting the engine is to give the starting hand wheel a turn to the right or left, according to whether the boat is to be driven astern or ahead.

Speed control is taken care of by a small hand wheel which changes the setting of the governor springs. An indicator in connection with this governor shows the change in speed as the hand wheel is turned.

The simplicity of this control scheme is due mainly to the simplicity of the airless injection of fuel. A simple fuel pump is required for each cylinder and it has been possible in this engine to so arrange the mechanism that the fuel injection is cut off at the time the control wheel is thrown to the starting position. During this starting period the engine operates by means of compressed air and as soon as it turns over the control is thrown to the run position and injection of the fuel and firing begins. The whole operation takes only a few seconds.

Lubrication Is Automatic

Another detail which has an important bearing on diesel engine dependability is in the arrangement which is provided for lubrication. In the early days entire dependence was placed on the use of oil cups and oil holes and the oil can which was an important part of the operation equipment of the engineer. In the modern diesel engine, however, the operator is relieved of any such duties as the lubrication is entirely automatic and is not dependent on the personal efficiency of the operating forces. Mechanical lubricators are driven by the engine and every bearing surface is lubricated with just the proper amount of oil. In addition to the fact that the engine is properly lubricated, insuring dependability in operation, the

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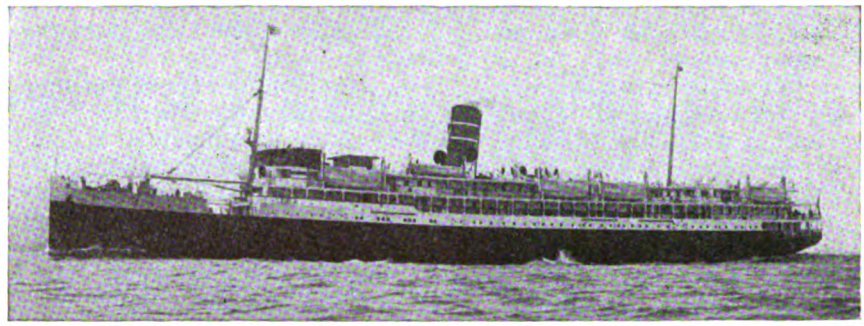

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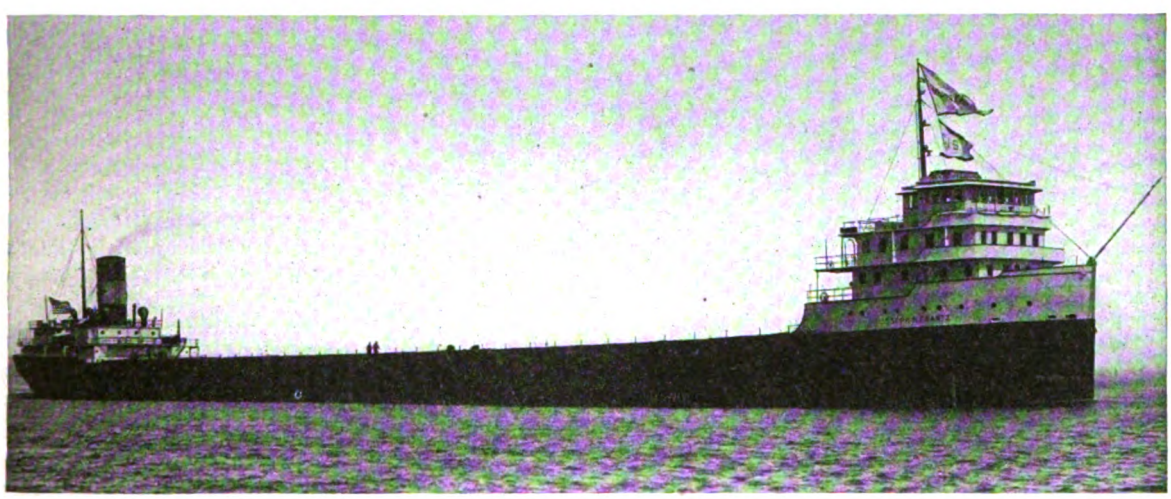

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quantity of lubricating oil used is also reduced. In the early diesel engines the cost of lubricating oil sometimes almost equalled the cost of the fuel oil consumed. Automatic lubrication, with consequent reduction in waste, has meant that it is possible to guarantee 1500 brake horsepower hours per gallon of lubricating oil, which is about one-fourth of that required by some of the early engines.

While increased dependability of the diesel oil engine may be partly attributed to improved design, better manufacturing methods have also had an important share in bringing about this result. One of the troubles experienced in the early engines was in connection with crankshaft failures. Many engineers thought that this was due to the inherent characteristics of diesel engine operation, but later experience has shown that it was due almost entirely to lax manufacturing methods.

Improve Crankshaft Manufacture

Crankshaft manufacture is a metallurgical problem and by the adoption of metallurgical methods it has been possible to produce crankshafts which will stand up in service. In the marine diesel engine, which has been described here, the specifications for crankshaft steel call for pouring the ingot in a special mold, so that the metal runs in at the bottom and rises to the top. This top metal comprises 30 per cent of the ingot and is cropped off and discarded. The ingots are then heated in furnaces and the shaft is worked out into rough shape under a huge hydraulic press. This operation refines the metal through its entire cross section, which is not the case where steam hammer methods are used.

Heat treatment is under the control of the laboratory and the treatment for each shaft is determined by the actual analysis of a bar taken from the shaft. Micro photographs show the grain structure both before and after heat treating and the physical and chemical characteristics are checked for every shaft.

It would be possible to elaborate but the point to keep in mind is that the modern diesel engine is dependable, not only from the standpoint of design, but also because of the care which is taken in building it. As a result, cracking of cylinder heads and breakage of crankshafts and other troubles have been eliminated.

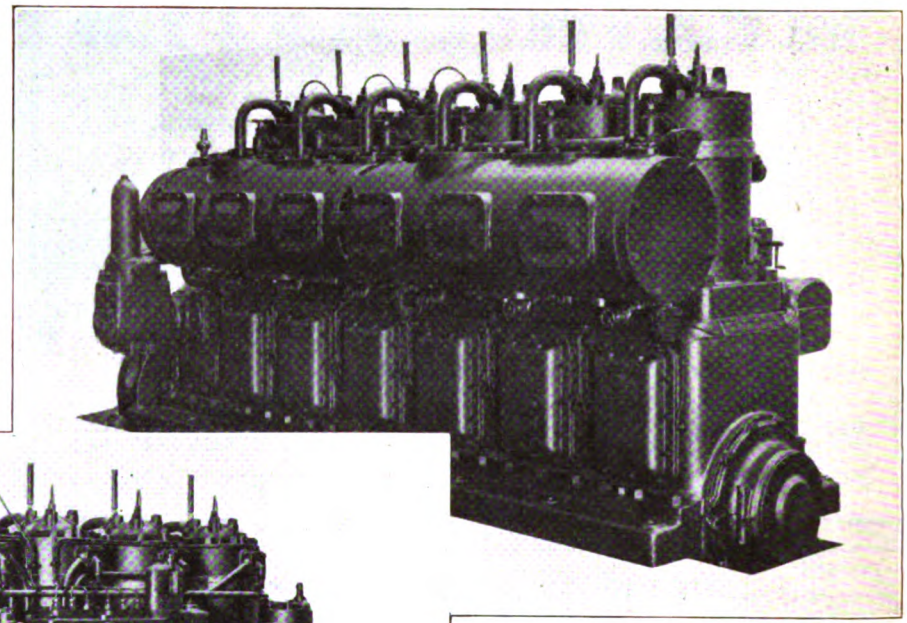
On account of this mechanical dependability, repair expense is very low. With the possibility of crankshaft breakage and cracked cylinder heads eliminated, there is not much else in the case of the two cycle airless injection engine which can go wrong. In fact, records of installation show in a great many cases that the repair expense has been under $100 a year over a period of several years.

Will Not Become Obsolete

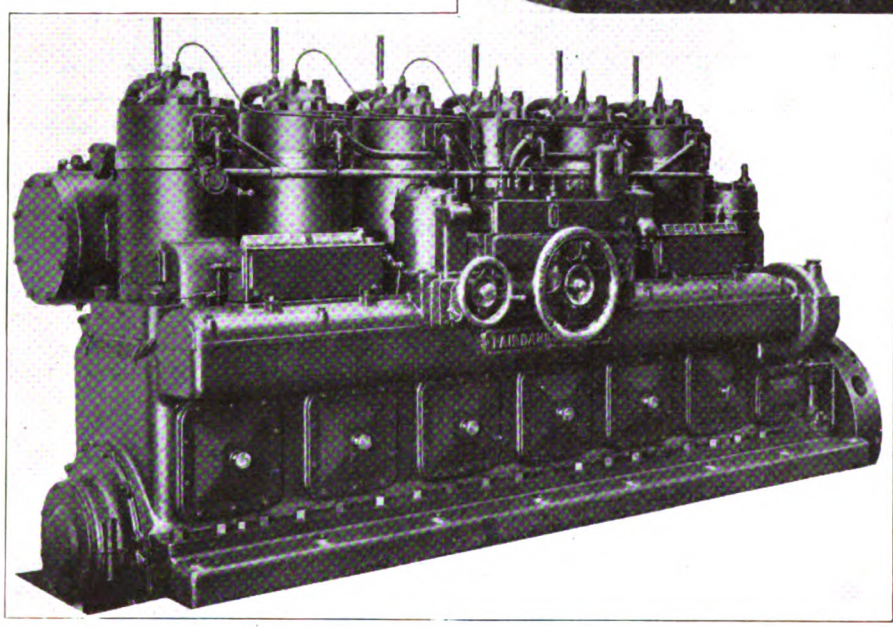
One of the points which always comes up for consideration is the probable life of a diesel engine. This life has a direct relation to the dependability of the unit and it also rests upon a consideration of obsolescence. Mechanical equipment, such as steam engines and motors do not wear out, but rather become obsolete because new types of equipment are brought out which are so much more efficient that it is no longer profitable to keep on using the original installations. The whole history of steam power development is full of instances where steam turbines and engines have only been operated three or four years and then have been replaced by more efficient machines.

The diesel engine, however, is so nearly a perfect machine from a thermal efficiency standpoint that the room for improvement is not very large. For that reason most of the improvements have been along mechanical lines to insure greater dependability in operation.

A diesel engine therefore does not become obsolete and there is no need to replace it from that standpoint. Under reasonable conditions the engine should operate almost indefinitely and certainly an assumption of a life of 25 years is quite reasonable.



EXHAUST SIDE OF THE SIX CYLINDER UNIT LOOKING AFT—THIS ENGINE IS BUILT IN TWO SIZES—360 HORSEPOWER AND 180 HORSEPOWER



CONTROL SIDE OF SIX CYLINDER UNIT LOOKING AFT—THE SMALL HANDWHEEL CHANGES THE SETTING OF THE GOVERNOR SPRINGS GIVING A WIDE VARIATION OF SPEED CONTROL—THE LARGE HANDWHEEL IS FOR STARTING AND REVERSING

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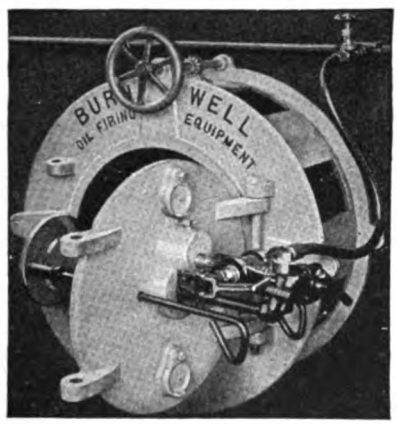

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T. S. Motorship Touraine

(*Continued from Page* 14)

holds aft. The double bottom is fitted for water ballast or fuel oil and the vessel is capable of carrying sufficient oil for a cruising mileage of about 25,000 miles. The fore peak is arranged for water ballast and the aft peak for fresh water.

The five hatches on the shelterdeck are 18 feet wide with a mean length of about 35 feet. For each hold there are fitted four 5 ton derricks, while for hatches two and three, an additional pair of 1½-ton derricks are fitted, so that these two hatches may be served by six derricks at one time. A 25-ton derrick may be rigged up for holds two and four. Furthermore, a smaller hatch is fitted on the poop-deck, served by two 1½-ton derricks. The ship carries two masts and eight samsonposts. There are ten 5-ton winches, four 1½-ton winches, one 5-ton warping winch on the poop and a windlass for 2 5/16-inch chain. The winches and windlass are all electrically driven and were supplied by Thomas B. Thrige, Odense. The steering gear, which is mounted aft, is also electrically driven and was supplied by Atlas Werke, A. G. Bremen.

A Few Passenger Accommodations

In the forward deckhouse there are four two-berth passenger cabins and a large saloon, all tastefully fitted up in dark mahogany. In the same deckhouse rooms are provided for a hospital, steward, pantry, and bath. In the house, above the deckhouse aft, are the captain's room and a passenger cabin and a special suite of rooms with bath for the owner's use.

On the bridge is a house of teak with steering room, chart room, wireless telegraphy office and accommodations for the wireless operators. The wireless telegraphy office is fitted with a 1½-kilowatt Marconi set. The deck and engine room officers are quartered in the deckhouse around the motor casing. At the forward end is a messroom and aft is a large galley arranged for oil firing. The crew's accommodations are arranged aft in well-lighted and well-ventilated cabins, two men in each. For the crew there are two messes, shower baths and toilets. The vessel is fitted with fire extinguishing apparatus for use in the holds and the engine rooms on the carbon dioxide system, installed by the Lux Company, Oslo, Norway.

Under the forward deckhouse on the shelterdeck is a spacious provision room with additional refrigerated compartments for meat, vegetables and beer. The refrigerating plant is supplied by Thomas Ths. Sabroe & Co., Aarhus, Denmark. Electric lighting is installed throughout the vessel and also for use in connection with the deck and navigating lights.

Twin Diesel Engines

The propelling machinery consists of two 7-cylinder Burmeister & Wain standard single-acting Diesel engines capable of giving a total output of 5600 indicated horsepower at 135 to 140 revolutions per minute.

The main engines are of the builders latest type with square cylinder heads, bolted together four and four, connected to the bedplate through long strain bolts, taking up all the combustion stresses, allowing the frames between the cylinder groups and the bedplate to be of light design. The compressor for the injection air is located at the forward end.

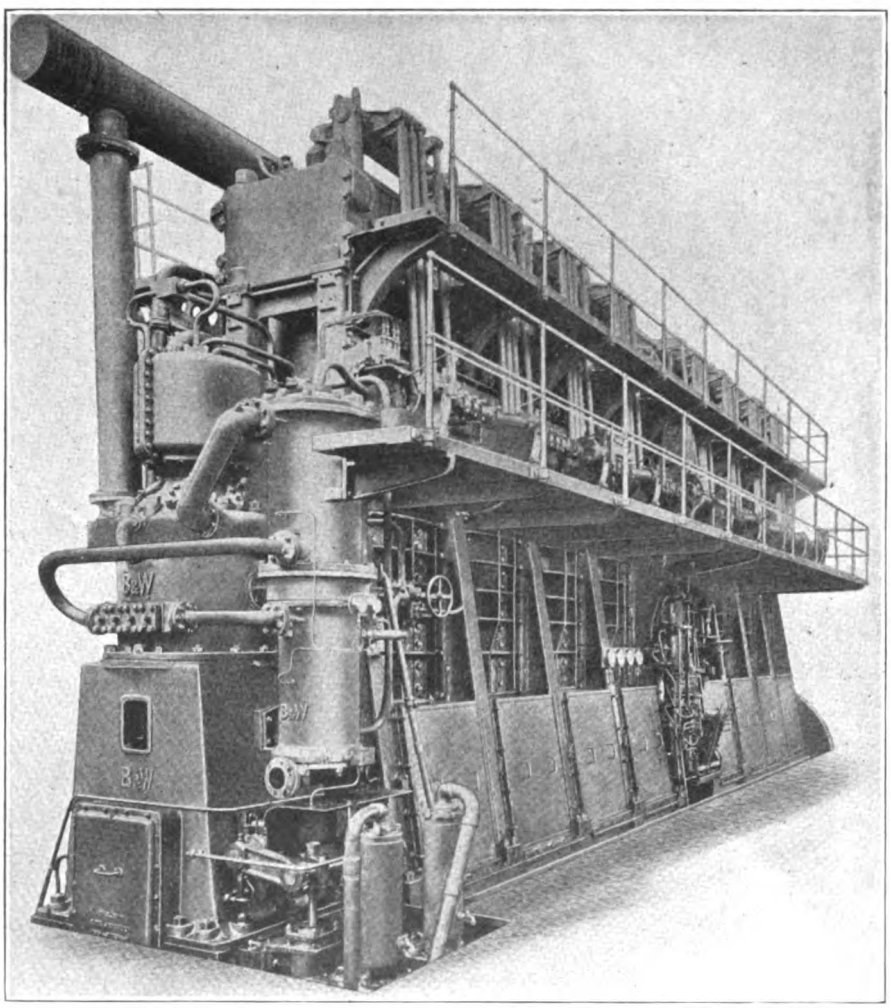
The valves are arranged in the most practical way, the fuel valves being slightly off the centre with the exhaust and inlet valves on each side. Instead of having separate inlet pipes for each cylinder, as used on the older design, a long horizontal inlet pipe for all valves is provided with branches leading down to the cylinders.

Auxiliary Engines and Machinery

Electric current of 220 volts d. c. is furnished by three 100-kilowatt generators coupled to three 3-cylinder auxiliary Diesel engines of 150 brake horsepower. Directly coupled to each auxiliary engine is a combined injection and maneuvering air compressor which supplies the necessary injection air for the auxiliary engine itself and if necessary compressed air for maneuvering the main engines.

All the auxiliary machinery is electrically driven, and consists of two combined cooling water and lubricating oil pumps, each one of sufficient capacity for supplying the necessary quantity of cooling water and lubricating oil for the main engines, a fuel oil pump, ballast pump, bilge and sanitary pump and one hand driven emergency compressor. For heating purposes there is installed an oil-fired donkey boiler of 100 square feet heating surface.

The trial trip was a complete success in every respect, after which the M. S. TOURAINE immediately started on her maiden voyage to Oslo and from there direct to Australia.



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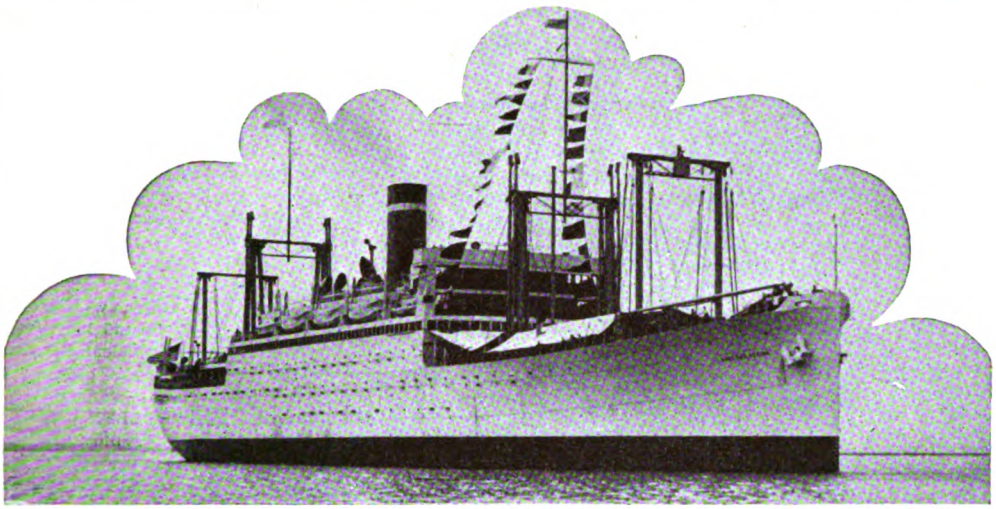

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New Trade Publications

INDICATING THERMOMETERS. — Bulletin No. 148 recently issued by The Foxboro Co., Inc., Foxboro, Mass., is a 36-page pamphlet, well arranged and printed. The dial type indicating thermometer as developed by The Foxboro Co. is described and illustrated quite fully in this bulletin. Illustrations and descriptions of practical applications are also given. Price lists of the complete equipment and parts will be found. The Foxboro Co. has had many years experience in instrument work and are therefore specialists in their line, and the information contained in this bulletin can be depended upon to be accurate and up-to-date.

ELECTRIC DRILLS.—The Hisey-Wolf Machine Co., Cincinnati, have come out with a new bulletin No. 108 which describes the latest Hisey ⅝ inch capacity standard duty universal electric drill. This drill is equipped with a standard Hisey motor. The bulletin shows a sectional cut of the drill and quite fully describes all details.

CENTRIFUGAL PUMPS.—An interesting and thoroughly up-to-date discussion of the design and applications of centrfugal pumps is presented in a profusely and very excellently illustrated 72-page book issued by the De Laval Steam Turbine Co., Trenton, N. J. This company manufactures centrifugal pumps of the single stage and multi-stage types for power plant, water works, drainage, hydraulic pressure and marine services, and first introduced in 1901 the high efficiency, high speed, high head centrifugal pump in practically the present form adopted by most builders of centrifugal pumps, with two part casing split in the plane of the shaft axis. This book on centrifugal pumps, aside from detailing the particular products of De Laval, will be of considerable value to any engineer who wants tokeep posted on this type of pump.

WELDING RODS.—Chicago Steel & Wire Co., Chicago, has recently brought out a new catalog on iron or steel filler rods for both gas and metallic arc welding. The little pamphlet is virtually a treatise on the properties of iron or steel filler rods for welding. Futhermore, most of the subject matter is new and has been developed by this company. The experience set down in this pamphlet is the result of years of patient and expensive research. Anyone responsible for welding will find this little booklet of genuine value.

ELECTRIC CHARGING PLUGS & RECEPTACLES.—A very complete new catalog of 71 pages attractively prepared and illustrated has been brought out by Albert & J. M. Anderson Mfg. Co., Boston. A great variety of plugs and receptacles of all kinds for electrical work is illustrated. The plugs and receptacles more particularly described in this bulletin are for charging storage batteries, for electric vehicles, trucks, tractors and railway cars as well as batteries for other uses; and also for connections of portable electric apparatus and similar applications. Extreme simplicity and rugged construction and design is the keynote of this equipment.

PUNCH ATTACHMENTS. — A broadside showing more than 30 special attachments for its punch presses, to do a wide variety of work, is issued by the Cleveland Punch & Shear Works, Co., Cleveland. Incidentally the company also shows some of its other products.

TIME LIMIT CONTROLLER.—Cutler-Hammer Mfg. Co., Milwaukee, illustrates its inductive time limit controller in a bulletin just issued. In this type limit control is obtained without dashpot or other mechanical means for securing the uniform period of acceleration. Various installations are described and the complete panel with types of magnetic switches is shown.

WIRE ROPE.—Bruntons, Musselburgh, Scotland, which is manufacturing wire ropes of a special type under license from the American patentee, has issued a booklet illustrating basic improvements in wire rope represented by the special rope it produces. The booklet is well illustrated as to the formation of the strands of rope and that attachments used in connection with it.

Business News for the Marine Trade

Steam Specialty Co., 2025 Avenue B, Galveston, Tex., D. K. Bowie, secretary, has been incorporated to distribute specialties and steam engineering supplies for stationary and marine engines.

Tampa Shipbuilding & Engineering Co., Tampa, Fla., is having plans made for rebuilding the burned portion of its steel fabricating plant.

Marine Mfg. Supply Co., Pittsburgh, has taken an order from the Carnegie Steel Co. to furnish three special improved capstan units for a steamer the hull of which will be built b. the American Bridge Co.

Todd Dry Dock Engineering & Repair Corp., New York, has been formed by consolidation of the Tebo Yacht Basin Co., the Clinton Dry Docks and the Todd Oil Burner & Engineering Corp., with 10,000 shares of common stock with no par value, by J. H. Todd, W. H. Smith and J. McDonald. Cullen & Dyckman, 177 Montague street, New York, are attorneys.

City Island-Port Washington Ferry Co., New York, has been incorporated with $500,000 capital by M. S. Iverson, G. A. Sweeting and J. P. Conron. J. P. Rudden, Jamaica, N. Y., is attorney.

Copperfield Shipping Co. Inc., Mobile, Ala., has been incorporated with $10,000 capital by Walter Wrightson and Ernest F. Ladd, 1613 Government street.

J. W. Young, president of the Hollywood Land & Water Co., Hollywood, Fla., has bought five 4-mast schooners and one steamship. He will buy two more steam freighters and an ocean going tugboat.

Aiken Towboat & Barge Co., I. H. Aiken, president, New York, will establish barge lines at Miami and Tampa and will erect warehouses at both places.

Eastern Steamship Co., Richmond, Va., Galen L. Stone, New York, president, has bought the Richmond-New York Steamship Co. and will operate it.

Atlantic City Speed Boat Corp. has been incorporated at Camden, N. J., to build speed boats with $100,000 capital.

Empire Fire & Marine Brokers Corp., New York, has been incorporated with $10,000 capital by F. I. Finkler, R. Greenbaum and C. F. Burden. Finkler & McEntire, 32 Broadway, New York, are attorneys.

Engel-Megee Towing & Transportation Corp., New York, has been incorporated with $100,000 capital by C. E. Engel and S. M. Engel and J. H. Megee. J. S. Twadell, 150 Nassau street, is attorney.

Oceanic Stevedoring Co. of Texas, Houston, Tex., has been incorporated with $10,000 capital by Raymond D. Sullivan and Charles E. Craig, 1648 West Main street.

Alexander Construction Co. Inc., 830 Audubon building, New Orleans, has taken over the floating equipment of the Lester F. Alexander Co. and will continue operating tugs and barges for construction work on jetties and similar work.

Clewiston Iron Co., Wilmington, Del., has been incorporated with $50,000 capital to build boats, docks and piers. The Corporation Registry Co., Wilmington, is its attorney.

Mack Marine Corp., Maspeth, N. Y., has been incorporated with 500 shares common stock no par value to operate boats by P. J. Dobson, C. P. Schroetter and W. J. Eldredge. Foley & Martin, 64 Wall street, are attorneys.

Greene Line, Huntington, W. Va., Jesse Hughes, manager, has bought 300 feet of river frontage and will begin construction of a terminal wharf and warehouses at once, including a wharfboat with loading and conveying cranes, storage building 60x90 feet and other facilities.

Minettshields Ltd., Bracebridge, Ont., has been incorporated with $40,000 capital to build and deal in ships and boats by Fraser K. Wilson, Florence Wilson and Wilfred A. Toogood.

Hudson Navigation Corp. has been incorporated in Delaware with $1,455,000 capital by Edward D. Kinle, New York. United States Corp. Co., Wilmington, is agent.

Climax Marine Repair & Supply Co., New York, has been incorporated with $15,000 capital by E. F. Quinn and B. R. Julien. A. M. Grill, 34 Wall street, is attorney.

Blue Dolphin Co., Kansas City, Mo., has been incorporated with $25,000 capital to operate a steamship line by W. A. Velie and A. W. Tyle, 5728 Grand avenue.

Thresher Bros., Sanford, Fla., is building a warehouse and freight dock 75x350 feet, joining rail and river transportation of freight.

Mississippi Warrior Barge Line Service, J. P. Higgins manager, Federal Reserve Bank building, St. Louis, is said to be in the market for 20 steel barges of 2000 tons capacity each.

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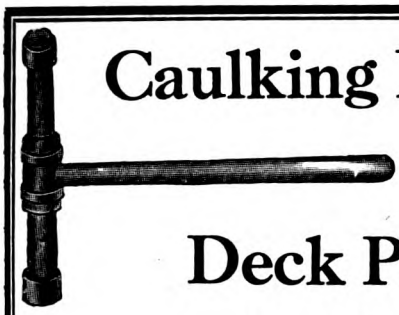

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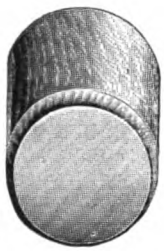

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If it is Marine Hardware, we have it.

Send for our latest catalogue, containing sizes and prices of Marine Hardware items of every description.

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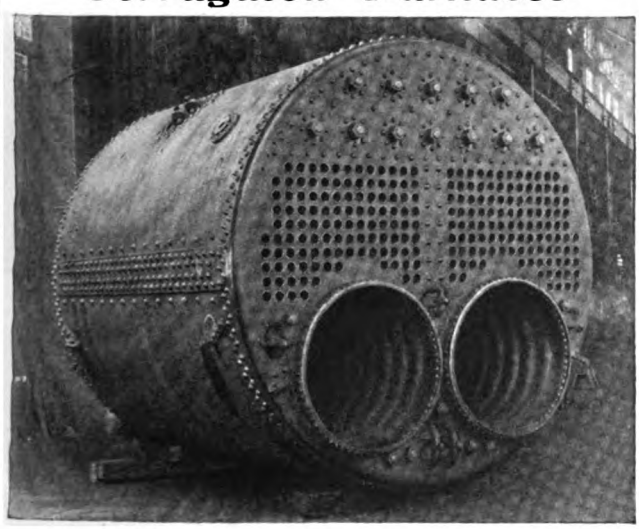

for marine boilers

CONFORM to standards and specifications of inspection bureaus and societies.

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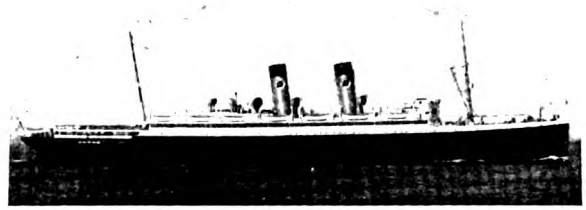

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—equipped for ship to shore communication —from distances as great as five, six and even eight thousand miles.

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Keep Great Lakes Intact

(*Continued from Page* 21)

and to be permitted to join as complainants the states of Minnesota, Ohio and Pennsylvania.

"On Jan. 4, 1926, the state of Illinois filed a demurrer to the amended complaint, and the sanitary district filed its answer. The court fixed Jan. 25 as the time for filing briefs by the state of Illinois in support of its demurrer, and allowed the complainants until Feb. 25 to file briefs, a reply brief, if any, to be filed by March 8. The court also assigned the case for argument on the demurrer on March 8, 1926."

A meeting of the attorney generals of the states concerned was held with the view of co-ordinating their several efforts in the fight against the Chicago sanitary district. Those attending were: H. H. Griswold, first assistant attorney general of Ohio; Clifford L. Hilton, attorney general of Minnesota; Henry S. Sweeney, Thomas J. Green and S. F. Master, assistant attorneys general of Michigan; Mr. Ekern, R. T. Jackson, special assistant attorney general of Wisconsin; Fred C. Gause, special assistant attorney general of Indiana; C. S. Ferris, special assistant attorney general of New York and Messrs. Goulder and Baker, representing the Lake Carriers' association.

No announcement of the plans drawn at this meeting was made. It is expected Michigan will go beyond the other states in the legal fight in contending that congress has no right to order a diversion of Great Lakes water.

Definite Steps Taken

Real progress toward effective unity of action among the many diversified elements bitterly opposed to Chicago's water steal, and a clearer realization of that city's attitude of indifference to the rights of navigation, resulted from the two days' meeting in Detroit. Two resolutions were adopted, the first protesting against "any legislation at the hands of congress that may sanction the diversion or abstraction of waters likely to lower the levels of the Great Lakes and thus impair the commerce thereof—a commerce which serves not only single communities and states, but serves the nation as a whole."

The second resolution read: "We appeal to congress to provide legislation which shall protect the Great Lakes as a navigation highway, against the repetition of the blunder committed by a former secretary of war in granting a water diversion permit to the city of Chicago, which has proved a great public injury and to make it a duty of the present and succeeding secretaries of war to correct this blunder to the end that the inland seas may serve the primary purpose for which nature designed them, namely, for navigation."

A committee of officers and directors of the Great Lakes Harbor association it was decided should be sent within a month to see President Coolidge, the secretaries of state and war, and committee members of the house and senate, to protest against the diversion of lake water and to constructively aid in the legislative contest of all lake cities and states against Chicago to prevent the legalization of this de facto illegal diversion now going on. This committee will also support in every way possible the suits of the attorney generals of the several states before the Supreme Court. Both offensive and defensive action will be taken in congress. The league of Great Lakes cities specifically will fight the Hull bill which would legalize 10,000 cubic feet per second or any amount needed by Chicago for sanitation and, incidentally, as a talking point, for Lakes to Gulf navigation. On the offensive, to ask congress to abrogate authority to grant withdrawal of Lake water.

MARINE DEPARTMENT
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